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UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, Secretary
BUREAU OF LAND MANAGEMENT
MARION CLAWSON, Director

✦

STANDARD FIELD TABLES
AND
TRIGONOMETRIC FORMULAS

A supplement to the Manual of Instructions
for the Survey of the Public Lands
of the United States

SEVENTH EDITION 1950

Prepared in the Division of Cadastral Engineering

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Manual of Instructions for the Survey of the Public Lands of the United States, edition of 1947.

Standard Field Tables (a supplement to the Manual of Surveying Instructions).

Ephemeris of the Sun, Polaris, and Other Selected Stars, published annually in advance (a supplement to the Manual of Surveying Instructions).

Restoration of Lost or Obliterated Corners and Subdivision of Sections, 1939 (a compendium of the rules that are applicable within the area of the United States rectangular surveys, for the guidance of county and other local surveyors, with explanation of the methods relating to retracements).

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Standard Field Tables.

TABLE 1.—UNITS OF MEASURE, ETC.

Units of Linear Measure.

1 chain= 100 links.
= 66 feet.
1 mile = 80 chains.
= 5,280 feet.

Units of Area.

1 acre= 10 square chains.
= 43,560 square feet.
1 square mile= 640 acres.

Expansion of Steel Tapes.

The coefficient of expansion of steel tapes=0.0000065 for 1° F.

Conversion Tables.

Chains to feet.

1	66
2	132
3	198
4	264
5	330
6	396
7	462
8	528
9	594
10	660

Feet to chains.

100	1.51515
200	3.03030
300	4.54546
400	6.06061
500	7.57576
600	9.09091
700	10.60606
800	12.12121
900	13.63636
1,000	15.15152

Links to feet.

1	0.66
2	1.32
3	1.98
4	2.64
5	3.30
6	3.96
7	4.62
8	5.28
9	5.94
10	6.60

Feet to links.

1	1.5
2	3.0
3	4.5
4	6.1
5	7.6
6	9.1
7	10.6
8	12.1
9	13.6
10	15.2

See pp. 226 to 229 for extended conversion tables.

TABLE 2.—REDUCTION IN LATITUDE TO SOUTH BOUNDARY OF TOWNSHIP.

Chs.	Miles.					
	0	1	2	3	4	5
	′	′	′	′	′	′
0	0.0	0.9	1.7	2.6	3.5	4.3
10	0.1	1.0	1.8	2.7	3.6	4.4
20	0.2	1.1	2.0	2.8	3.7	4.6
30	0.3	1.2	2.1	2.9	3.8	4.7
40	0.4	1.3	2.2	3.0	3.9	4.8
50	0.5	1.4	2.3	3.1	4.0	4.9
60	0.6	1.5	2.4	3.2	4.1	5.0
70	0.8	1.6	2.5	3.4	4.2	5.1
80	0.9	1.7	2.6	3.5	4.3	5.2

CORRECTIONS FOR CONVERGENCY WITHIN A TOWNSHIP.

Lat.	1 mi.	2 mi.	3 mi.	4 mi.	5 mi.
° °	′	′	′	′	′
25 to 30	0	1	1	2	2
30 to 35	1	1	2	2	3
35 to 40	1	1	2	3	3
40 to 45	1	2	2	3	4
45 to 50	1	2	3	4	5
50 to 55	1	2	3	5	6
55 to 60	1	3	4	5	7
60 to 65	2	3	5	7	8
65 to 70	2	4	6	8	10

TOWNSHIP DIAGRAM.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

TABLE 3.—TRAVERSE TABLE FOR THE CORRECTION OF RANDOM LINES.

0° ′	Distance in chains. 10	20	30	40	50	60	70	80	90	100	′
	Departure in links.										
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60
1	0.3	0.6	0.9	1.2	1.5	1.7	2.0	2.3	2.6	2.9	59
2	0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.7	5.2	5.8	58
3	0.9	1.7	2.6	3.5	4.4	5.2	6.1	7.0	7.9	8.7	57
4	1.2	2.3	3.5	4.7	5.8	7.0	8.1	9.3	10.5	11.6	56
5	1.5	2.9	4.4	5.8	7.3	8.7	10.2	11.6	13.1	14.5	55
6	1.7	3.5	5.2	7.0	8.7	10.5	12.2	14.0	15.7	17.5	54
7	2.0	4.1	6.1	8.1	10.2	12.2	14.3	16.3	18.3	20.4	53
8	2.3	4.7	7.0	9.3	11.6	14.0	16.3	18.6	20.9	23.3	52
9	2.6	5.2	7.9	10.5	13.1	15.7	18.3	20.9	23.6	26.2	51
10	2.9	5.8	8.7	11.6	14.5	17.5	20.4	23.3	26.2	29.1	50
11	3.2	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8	32.0	49
12	3.5	7.0	10.5	14.0	17.5	20.9	24.4	27.9	31.4	34.9	48
13	3.8	7.6	11.3	15.1	18.9	22.7	26.5	30.3	34.0	37.8	47
14	4.1	8.1	12.2	16.3	20.4	24.4	28.5	32.6	36.7	40.7	46
15	4.4	8.7	13.1	17.5	21.8	26.2	30.5	34.9	39.3	43.6	45
16	4.7	9.3	14.0	18.6	23.3	27.9	32.6	37.2	41.9	46.5	44
17	4.9	9.9	14.8	19.8	24.7	29.7	34.6	39.6	44.5	49.5	43
18	5.2	10.5	15.7	20.9	26.2	31.4	36.7	41.9	47.1	52.4	42
19	5.5	11.1	16.6	22.1	27.6	33.2	38.7	44.2	49.7	55.3	41
20	5.8	11.6	17.5	23.3	29.1	34.9	40.7	46.5	52.4	58.2	40
21	6.1	12.2	18.3	24.4	30.5	36.7	42.8	48.9	55.0	61.1	39
22	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	38
23	6.7	13.4	20.1	26.8	33.5	40.1	46.8	53.5	60.2	66.9	37
24	7.0	14.0	20.9	27.9	34.9	41.9	48.9	55.9	62.8	69.8	36
25	7.3	14.5	21.8	29.1	36.4	43.6	50.9	58.2	65.4	72.7	35
26	7.6	15.1	22.7	30.3	37.8	45.4	52.9	60.5	68.1	75.6	34
27	7.9	15.7	23.6	31.4	39.3	47.1	55.0	62.8	70.7	78.5	33
28	8.1	16.3	24.4	32.6	40.7	48.9	57.0	65.2	73.3	81.4	32
29	8.4	16.9	25.3	33.7	42.2	50.6	59.0	67.5	75.9	84.4	31
30	8.7	17.5	26.2	34.9	43.6	52.4	61.1	69.8	78.5	87.3	30
31	9.0	18.0	27.1	36.1	45.1	54.1	63.1	72.1	81.2	90.2	29
32	9.3	18.6	27.9	37.2	46.5	55.8	65.2	74.5	83.8	93.1	28
33	9.6	19.2	28.8	38.4	48.0	57.6	67.2	76.8	86.4	96.0	27
34	9.9	19.8	29.7	39.6	49.5	59.3	69.2	79.1	89.0	98.9	26
35	10.2	20.4	30.5	40.7	50.9	61.1	71.3	81.4	91.6	101.8	25
36	10.5	20.9	31.4	41.9	52.4	62.8	73.3	83.8	94.2	104.7	24
37	10.8	21.5	32.3	43.1	53.8	64.6	75.3	86.1	96.9	107.6	23
38	11.1	22.1	33.2	44.2	55.3	66.3	77.4	88.4	99.5	110.5	22
39	11.3	22.7	34.0	45.4	56.7	68.1	79.4	90.8	102.1	113.4	21
40	11.6	23.3	34.9	46.5	58.2	69.8	81.4	93.1	104.7	116.4	20
41	11.9	23.9	35.8	47.7	59.6	71.6	83.5	95.4	107.3	119.3	19
42	12.2	24.4	36.7	48.9	61.1	73.3	85.5	97.7	110.0	122.2	18
43	12.5	25.0	37.5	50.0	62.5	75.0	87.6	100.1	112.6	125.1	17
44	12.8	25.6	38.4	51.2	64.0	76.8	89.6	102.4	115.2	128.0	16
45	13.1	26.2	39.3	52.4	65.4	78.5	91.6	104.7	117.8	130.9	15
46	13.4	26.8	40.1	53.5	66.9	80.3	93.7	107.0	120.4	133.8	14
47	13.7	27.3	41.0	54.7	68.4	82.0	95.7	109.4	123.0	136.7	13
48	14.0	27.9	41.9	55.8	69.8	83.8	97.7	111.7	125.7	139.6	12
49	14.3	28.5	42.8	57.0	71.3	85.5	99.8	114.0	128.3	142.5	11
50	14.5	29.1	43.6	58.2	72.7	87.3	101.8	116.4	130.9	145.4	10
51	14.8	29.7	44.5	59.3	74.2	89.0	103.8	118.7	133.5	148.3	9
52	15.1	30.3	45.4	60.5	75.6	90.8	105.9	121.0	136.1	151.3	8
53	15.4	30.8	46.2	61.7	77.1	92.5	107.9	123.3	138.7	154.2	7
54	15.7	31.4	47.1	62.8	78.5	94.2	110.0	125.7	141.4	157.1	6
55	16.0	32.0	48.0	64.0	80.0	96.0	112.0	128.0	144.0	160.0	5
56	16.3	32.6	48.9	65.2	81.4	97.7	114.0	130.3	146.6	162.9	4
57	16.6	33.2	49.7	66.3	82.9	99.5	116.1	132.6	149.2	165.8	3
58	16.9	33.7	50.6	67.5	84.4	101.2	118.1	135.0	151.8	168.7	2
59	17.2	34.3	51.5	68.6	85.8	103.0	120.1	137.3	154.5	171.6	1
60	17.5	34.9	52.4	69.8	87.3	104.7	122.2	139.6	157.1	174.5	0
	Latitude in links.										89°

TABLE 4.—TRAVERSE TABLE.

Distance.	¼°.		½°.		¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	1.00	0.00	1.00	0.01	1.00	0.01	1
2	2.00	0.01	2.00	0.02	2.00	0.03	2
3	3.00	0.01	3.00	0.03	3.00	0.04	3
4	4.00	0.02	4.00	0.03	4.00	0.05	4
5	5.00	0.02	5.00	0.04	5.00	0.07	5
6	6.00	0.03	6.00	0.05	6.00	0.08	6
7	7.00	0.03	7.00	0.06	7.00	0.09	7
8	8.00	0.03	8.00	0.07	8.00	0.10	8
9	9.00	0.04	9.00	0.08	9.00	0.12	9
10	10.00	0.04	10.00	0.09	10.00	0.13	10
11	11.00	0.05	11.00	0.10	11.00	0.14	11
12	12.00	0.05	12.00	0.10	12.00	0.16	12
13	13.00	0.06	13.00	0.11	13.00	0.17	13
14	14.00	0.06	14.00	0.12	14.00	0.18	14
15	15.00	0.07	15.00	0.13	15.00	0.20	15
16	16.00	0.07	16.00	0.14	16.00	0.21	16
17	17.00	0.07	17.00	0.15	17.00	0.22	17
18	18.00	0.08	18.00	0.16	18.00	0.24	18
19	19.00	0.08	19.00	0.17	19.00	0.25	19
20	20.00	0.09	20.00	0.17	20.00	0.26	20
21	21.00	0.09	21.00	0.18	21.00	0.27	21
22	22.00	0.10	22.00	0.19	22.00	0.29	22
23	23.00	0.10	23.00	0.20	23.00	0.30	23
24	24.00	0.10	24.00	0.21	24.00	0.31	24
25	25.00	0.11	25.00	0.22	25.00	0.33	25
26	26.00	0.11	26.00	0.23	26.00	0.34	26
27	27.00	0.12	27.00	0.24	27.00	0.35	27
28	28.00	0.12	28.00	0.24	28.00	0.37	28
29	29.00	0.13	29.00	0.25	29.00	0.38	29
30	30.00	0.13	30.00	0.26	30.00	0.39	30
31	31.00	0.14	31.00	0.27	31.00	0.41	31
32	32.00	0.14	32.00	0.28	32.00	0.42	32
33	33.00	0.14	33.00	0.29	33.00	0.43	33
34	34.00	0.15	34.00	0.30	34.00	0.45	34
35	35.00	0.15	35.00	0.31	35.00	0.46	35
36	36.00	0.16	36.00	0.31	36.00	0.47	36
37	37.00	0.16	37.00	0.32	37.00	0.48	37
38	38.00	0.17	38.00	0.33	38.00	0.50	38
39	39.00	0.17	39.00	0.34	39.00	0.51	39
40	40.00	0.17	40.00	0.35	40.00	0.52	40
41	41.00	0.18	41.00	0.36	41.00	0.54	41
42	42.00	0.18	42.00	0.37	42.00	0.55	42
43	43.00	0.19	43.00	0.38	43.00	0.56	43
44	44.00	0.19	44.00	0.38	44.00	0.58	44
45	45.00	0.20	45.00	0.39	45.00	0.59	45
46	46.00	0.20	46.00	0.40	46.00	0.60	46
47	47.00	0.21	47.00	0.41	47.00	0.62	47
48	48.00	0.21	48.00	0.42	48.00	0.63	48
49	49.00	0.21	49.00	0.43	49.00	0.64	49
50	50.00	0.22	50.00	0.44	50.00	0.65	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	89¾°.		89½°.		89¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	¼°.		½°.		¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	51.00	0.22	51.00	0.45	51.00	0.67	51
52	52.00	0.23	52.00	0.45	52.00	0.68	52
53	53.00	0.23	53.00	0.46	53.00	0.69	53
54	54.00	0.24	54.00	0.47	54.00	0.71	54
55	55.00	0.24	55.00	0.48	55.00	0.72	55
56	56.00	0.24	56.00	0.49	56.00	0.73	56
57	57.00	0.25	57.00	0.50	57.00	0.75	57
58	58.00	0.25	58.00	0.51	57.99	0.76	58
59	59.00	0.26	59.00	0.51	58.99	0.77	59
60	60.00	0.26	60.00	0.52	59.99	0.79	60
61	61.00	0.27	61.00	0.53	60.99	0.80	61
62	62.00	0.27	62.00	0.54	61.99	0.81	62
63	63.00	0.27	63.00	0.55	62.99	0.82	63
64	64.00	0.28	64.00	0.56	63.99	0.84	64
65	65.00	0.28	65.00	0.57	64.99	0.85	65
66	66.00	0.29	66.00	0.58	65.99	0.86	66
67	67.00	0.29	67.00	0.58	66.99	0.88	67
68	68.00	0.30	68.00	0.59	67.99	0.89	68
69	69.00	0.30	69.00	0.60	68.99	0.90	69
70	70.00	0.31	70.00	0.61	69.99	0.92	70
71	71.00	0.31	71.00	0.62	70.99	0.93	71
72	72.00	0.31	72.00	0.63	71.99	0.94	72
73	73.00	0.32	73.00	0.64	72.99	0.96	73
74	74.00	0.32	74.00	0.65	73.99	0.97	74
75	75.00	0.33	75.00	0.65	74.99	0.98	75
76	76.00	0.33	76.00	0.66	75.99	0.99	76
77	77.00	0.34	77.00	0.67	76.99	1.01	77
78	78.00	0.34	78.00	0.68	77.99	1.02	78
79	79.00	0.34	79.00	0.69	78.99	1.03	79
80	80.00	0.35	80.00	0.70	79.99	1.05	80
81	81.00	0.35	81.00	0.71	80.99	1.06	81
82	82.00	0.36	82.00	0.72	81.99	1.07	82
83	83.00	0.36	83.00	0.72	82.99	1.09	83
84	84.00	0.37	84.00	0.73	83.99	1.10	84
85	85.00	0.37	85.00	0.74	84.99	1.11	85
86	86.00	0.38	86.00	0.75	85.99	1.13	86
87	87.00	0.38	87.00	0.76	86.99	1.14	87
88	88.00	0.38	88.00	0.77	87 99	1.15	88
89	89.00	0.39	89.00	0.78	88.99	1.16	89
90	90.00	0.39	90.00	0.79	89.99	1.18	90
91	91.00	0.40	91.00	0.79	90.99	1.19	91
92	92.00	0.40	92.00	0.80	91.99	1.20	92
93	93.00	0.41	93.00	0.81	92.99	1.22	93
94	94.00	0.41	94.00	0.82	93.99	1.23	94
95	95.00	0.41	95.00	0.83	94.99	1.24	95
96	96.00	0.42	96.00	0.84	95.99	1.26	96
97	97.00	0.42	97.00	0.85	96.99	1.27	97
98	98.00	0.43	98.00	0.86	97.99	1.28	98
99	99.00	0.43	99.00	0.86	98.99	1.30	99
100	100.00	0.44	100.00	0.87	99.99	1.31	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	89¾°.		89½°.		89¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	1°.		1¼°.		1½°.		1¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	1.00	0.02	1.00	0.02	1.00	0.03	1.00	0.03	1
2	2.00	0.03	2.00	0.04	2.00	0.05	2.00	0.06	2
3	3.00	0.05	3.00	0.07	3.00	0.08	3.00	0.09	3
4	4.00	0.07	4.00	0.09	4.00	0.10	4.00	0.12	4
5	5.00	0.09	5.00	0.11	5.00	0.13	5.00	0.15	5
6	6.00	0.10	6.00	0.13	6.00	0.16	6.00	0.18	6
7	7.00	0.12	7.00	0.15	7.00	0.18	7.00	0.21	7
8	8.00	0.14	8.00	0.17	8.00	0.21	8.00	0.24	8
9	9.00	0.16	9.00	0.20	9.00	0.24	9.00	0.27	9
10	10.00	0.17	10.00	0.22	10.00	0.26	10.00	0.31	10
11	11.00	0.19	11.00	0.24	11.00	0.29	10.99	0.34	11
12	12.00	0.21	12.00	0.26	12.00	0.31	11.99	0.37	12
13	13.00	0.23	13.00	0.28	13.00	0.34	12.99	0.40	13
14	14.00	0.24	14.00	0.31	14.00	0.37	13.99	0.43	14
15	15.00	0.26	15.00	0.33	14.99	0.39	14.99	0.46	15
16	16.00	0.28	16.00	0.35	15.99	0.42	15.99	0.49	16
17	17.00	0.30	17.00	0.37	16.99	0.45	16.99	0.52	17
18	18.00	0.31	18.00	0.39	17.99	0.47	17.99	0.55	18
19	19.00	0.33	19.00	0.41	18.99	0.50	18.99	0.58	19
20	20.00	0.35	20.00	0.44	19.99	0.52	19.99	0.61	20
21	21.00	0.37	21.00	0.46	20.99	0.55	20.99	0.64	21
22	22.00	0.38	21.99	0.48	21.99	0.58	21.99	0.67	22
23	23.00	0.40	22.99	0.50	22.99	0.60	22.99	0.70	23
24	24.00	0.42	23.99	0.52	23.99	0.63	23.99	0.73	24
25	25.00	0.44	24.99	0.55	24.99	0.65	24.99	0.76	25
26	26.00	0.45	25.99	0.57	25.99	0.68	25.99	0.79	26
27	27.00	0.47	26.99	0.59	26.99	0.71	26.99	0.82	27
28	28.00	0.49	27.99	0.61	27.99	0.73	27.99	0.86	28
29	29.00	0.51	28.99	0.63	28.99	0.76	28.99	0.89	29
30	30.00	0.52	29.99	0.65	29.99	0.79	29.99	0.92	30
31	31.00	0.54	30.99	0.68	30.99	0.81	30.99	0.95	31
32	32.00	0.56	31.99	0.70	31.99	0.84	31.99	0.98	32
33	32.99	0.58	32.99	0.72	32.99	0.86	32.98	1.01	33
34	33.99	0.59	33.99	0.74	33.99	0.89	33.98	1.04	34
35	34.99	0.61	34.99	0.76	34.99	0.92	34.98	1.07	35
36	35.99	0.63	35.99	0.79	35.99	0.94	35.98	1.10	36
37	36.99	0.65	36.99	0.81	36.99	0.97	36.98	1.13	37
38	37.99	0.66	37.99	0.83	37.99	0.99	37.98	1.16	38
39	38.99	0.68	38.99	0.85	38.99	1.02	38.98	1.19	39
40	39.99	0.70	39.99	0.87	39.99	1.05	39.98	1.22	40
41	40.99	0.72	40.99	0.89	40.99	1.07	40.98	1.25	41
42	41.99	0.73	41.99	0.92	41.99	1.10	41.98	1.28	42
43	42.99	0.75	42.99	0.94	42.99	1.13	42.98	1.31	43
44	43.99	0.77	43.99	0.96	43.98	1.15	43.98	1.34	44
45	44.99	0.79	44.99	0.98	44.98	1.18	44.98	1.37	45
46	45.99	0.80	45.99	1.00	45.98	1.20	45.98	1.40	46
47	46.99	0.82	46.99	1.03	46.98	1.23	46.98	1.44	47
48	47.99	0.84	47.99	1.05	47.98	1.26	47.98	1.47	48
49	48.99	0.86	48.99	1.07	48.98	1.28	48.98	1.50	49
50	49.99	0.87	49.99	1.09	49.98	1.31	49.98	1.53	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	89°.		88¾°.		88½°.		88¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	1°.		1¼°.		1½°.		1¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.99	0.89	50.99	1.11	50.98	1.34	50.98	1.56	51
52	51.99	0.91	51.99	1.13	51.98	1.36	51.98	1.59	52
53	52.99	0.92	52.99	1.16	52.98	1.39	52.98	1.62	53
54	53.99	0.94	53.99	1.18	53.98	1.41	53.97	1.65	54
55	54.99	0.96	54.99	1.20	54.98	1.44	54.97	1.68	55
56	55.99	0.98	55.99	1.22	55.98	1.47	55.97	1.71	56
57	56.99	0.99	56.99	1.24	56.98	1.49	56.97	1.74	57
58	57.99	1.01	57.99	1.27	57.98	1.52	57.97	1.77	58
59	58.99	1.03	58.99	1.29	58.98	1.54	58.97	1.80	59
60	59.99	1.05	59.99	1.31	59.98	1.57	59.97	1.83	60
61	60.99	1.06	60.99	1.33	60.98	1.60	60.97	1.86	61
62	61.99	1.08	61.99	1.35	61.98	1.62	61.97	1.89	62
63	62.99	1.10	62.99	1.37	62.98	1.65	62.97	1.92	63
64	63.99	1.12	63.98	1.40	63.98	1.68	63.97	1.95	64
65	64.99	1.13	64.98	1.42	64.98	1.70	64.97	1.99	65
66	65.99	1.15	65.98	1.44	65.98	1.73	65.97	2.02	66
67	66.99	1.17	66.98	1.46	66.98	1.75	66.97	2.05	67
68	67.99	1.19	67.98	1.48	67.98	1.78	67.97	2.08	68
69	68.99	1.20	68.98	1.51	68.98	1.81	68.97	2.11	69
70	69.99	1.22	69.98	1.53	69.98	1.83	69.97	2.14	70
71	70.99	1.24	70.98	1.55	70.98	1.86	70.97	2.17	71
72	71.99	1.26	71.98	1.57	71.98	1.88	71.97	2.20	72
73	72.99	1.27	72.98	1.59	72.97	1.91	72.97	2.23	73
74	73.99	1.29	73.98	1.61	73.97	1.94	73.97	2.26	74
75	74.99	1.31	74.98	1.64	74.97	1.96	74.97	2.29	75
76	75.99	1.33	75.98	1.66	75.97	1.99	75.96	2.32	76
77	76.99	1.34	76.98	1.68	76.97	2.02	76.96	2.35	77
78	77.99	1.36	77.98	1.70	77.97	2.04	77.96	2.38	78
79	78.99	1.38	78.98	1.72	78.97	2.07	78.96	2.41	79
80	79.99	1.40	79.98	1.75	79.97	2.09	79.96	2.44	80
81	80.99	1.41	80.98	1.77	80.97	2.12	80.96	2.47	81
82	81.99	1.43	81.98	1.79	81.97	2.15	81.96	2.50	82
83	82.99	1.45	82.98	1.81	82.97	2.17	82.96	2.53	83
84	83.99	1.47	83.98	1.83	83.97	2.20	83.96	2.57	84
85	84.99	1.48	84.98	1.85	84.97	2.23	84.96	2.60	85
86	85.99	1.50	85.98	1.88	85.97	2.25	85.96	2.63	86
87	86.99	1.52	86.98	1.90	86.97	2.28	86.96	2.66	87
88	87.99	1.54	87.98	1.92	87.97	2.30	87.96	2.69	88
89	88.99	1.55	88.98	1.94	88.97	2.33	88.96	2.72	89
90	89.99	1.57	89.98	1.96	89.97	2.36	89.96	2.75	90
91	90.99	1.59	90.98	1.99	90.97	2.38	90.96	2.78	91
92	91.99	1.61	91.98	2.01	91.97	2.41	91.96	2.81	92
93	92.99	1.62	92.98	2.03	92.97	2.43	92.96	2.84	93
94	93.99	1.64	93.98	2.05	93.97	2.46	93.96	2.87	94
95	94.99	1.66	94.98	2.07	94.97	2.49	94.96	2.90	95
96	95.99	1.68	95.98	2.09	95.97	2.51	95.96	2.93	96
97	96.99	1.69	96.98	2.12	96.97	2.54	96.95	2.96	97
98	97.99	1.71	97.98	2.14	97.97	2.57	97.95	2.99	98
99	98.98	1.73	98.98	2.16	98.97	2.59	98.95	3.02	99
100	99.98	1.75	99.98	2.18	99.97	2.62	99.95	3.05	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	89°.		88¾°.		88½°.		88¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	2°.		2¼°.		2½°.		2¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	1.00	0.03	1.00	0.04	1.00	0.04	1.00	0.05	1
2	2.00	0.07	2.00	0.08	2.00	0.09	2.00	0.10	2
3	3.00	0.10	3.00	0.12	3.00	0.13	3.00	0.14	3
4	4.00	0.14	4.00	0.16	4.00	0.17	4.00	0.19	4
5	5.00	0.17	5.00	0.20	5.00	0.22	4.99	0.24	5
6	6.00	0.21	6.00	0.24	5.99	0.26	5.99	0.29	6
7	7.00	0.24	6.99	0.27	6.99	0.31	6.99	0.34	7
8	7.99	0.28	7.99	0.31	7.99	0.35	7.99	0.38	8
9	8.99	0.31	8.99	0.35	8.99	0.39	8.99	0.43	9
10	9.99	0.35	9.99	0.39	9.99	0.44	9.99	0.48	10
11	10.99	0.38	10.99	0.43	10.99	0.48	10.99	0.53	11
12	11.99	0.42	11.99	0.47	11.99	0.52	11.99	0.58	12
13	12.99	0.45	12.99	0.51	12.99	0.57	12.99	0.62	13
14	13.99	0.49	13.99	0.55	13.99	0.61	13.98	0.67	14
15	14.99	0.52	14.99	0.59	14.99	0.65	14.98	0.72	15
16	15.99	0.56	15.99	0.63	15.98	0.70	15.98	0.77	16
17	16.99	0.59	16.99	0.67	16.98	0.74	16.98	0.82	17
18	17.99	0.63	17.99	0.71	17.98	0.79	17.98	0.86	18
19	18.99	0.66	18.99	0.75	18.98	0.83	18.98	0.91	19
20	19.99	0.70	19.98	0.79	19.98	0.87	19.98	0.96	20
21	20.99	0.73	20.98	0.82	20.98	0.92	20.98	1.01	21
22	21.99	0.77	21.98	0.86	21.98	0.96	21.97	1.06	22
23	22.99	0.80	22.98	0.90	22.98	1.00	22.97	1.10	23
24	23.99	0.84	23.98	0.94	23.98	1.05	23.97	1.15	24
25	24.98	0.87	24.98	0.98	24.98	1.09	24.97	1.20	25
26	25.98	0.91	25.98	1.02	25.98	1.13	25.97	1.25	26
27	26.98	0.94	26.98	1.06	26.97	1.18	26.97	1.30	27
28	27.98	0.98	27.98	1.10	27.97	1.22	27.97	1.34	28
29	28.98	1.01	28.98	1.14	28.97	1.26	28.97	1.39	29
30	29.98	1.05	29.98	1.18	29.97	1.31	29.97	1.44	30
31	30.98	1.08	30.98	1.22	30.97	1.35	30.96	1.49	31
32	31.98	1.12	31.98	1.26	31.97	1.40	31.96	1.54	32
33	32.98	1.15	32.97	1.30	32.97	1.44	32.96	1.58	33
34	33.98	1.19	33.97	1.33	33.97	1.48	33.96	1.63	34
35	34.98	1.22	34.97	1.37	34.97	1.53	34.96	1.68	35
36	35.98	1.26	35.97	1.41	35.97	1.57	35.96	1.73	36
37	36.98	1.29	36.97	1.45	36.96	1.61	36.96	1.78	37
38	37.98	1.33	37.97	1.49	37.96	1.66	37.96	1.82	38
39	38.98	1.36	38.97	1.53	38.96	1.70	38.96	1.87	39
40	39.98	1.40	39.97	1.57	39.96	1.74	39.95	1.92	40
41	40.98	1.43	40.97	1.61	40.96	1.79	40.95	1.97	41
42	41.97	1.47	41.97	1.65	41.96	1.83	41.95	2.02	42
43	42.97	1.50	42.97	1.69	42.96	1.88	42.95	2.06	43
44	43.97	1.54	43.97	1.73	43.96	1.92	43.95	2.11	44
45	44.97	1.57	44.97	1.77	44.96	1.96	44.95	2.16	45
46	45.97	1.61	45.96	1.81	45.96	2.01	45.95	2.21	46
47	46.97	1.64	46.96	1.85	46.96	2.05	46.95	2.25	47
48	47.97	1.68	47.96	1.88	47.95	2.09	47.94	2.30	48
49	48.97	1.71	48.96	1.92	48.95	2.14	48.94	2.35	49
50	49.97	1.74	49.96	1.96	49.95	2.18	49.94	2.40	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	88°.		87¾°.		87½°.		87¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	2°.		2¼°.		2½°.		2¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.97	1.78	50.96	2.00	50.95	2.22	50.94	2.45	51
52	51.97	1.81	51.96	2.04	51.95	2.27	51.94	2.49	52
53	52.97	1.85	52.96	2.08	52.95	2.31	52.94	2.54	53
54	53.97	1.88	53.96	2.12	53.95	2.36	53.94	2.59	54
55	54.97	1.92	54.96	2.16	54.95	2.40	54.94	2.64	55
56	55.97	1.95	55.96	2.20	55.95	2.44	55.94	2.69	56
57	56.97	1.99	56.96	2.24	56.95	2.49	56.93	2.73	57
58	57.96	2.02	57.96	2.28	57.94	2.53	57.93	2.78	58
59	58.96	2.06	58.95	2.32	58.94	2.57	58.93	2.83	59
60	59.96	2.09	59.95	2.36	59.94	2.62	59.93	2.88	60
61	60.96	2.13	60.95	2.39	60.94	2.66	60.93	2.93	61
62	61.96	2.16	61.95	2.43	61.94	2.70	61.93	2.97	62
63	62.96	2.20	62.95	2.47	62.94	2.75	62.93	3.02	63
64	63.96	2.23	63.95	2.51	63.94	2.79	63.93	3.07	64
65	64.96	2.27	64.95	2.55	64.94	2.84	64.93	3.12	65
66	65.96	2.30	65.95	2.59	65.94	2.88	65.92	3.17	66
67	66.96	2.34	66.95	2.63	66.94	2.92	66.92	3.21	67
68	67.96	2.37	67.95	2.67	67.94	2.97	67.92	3.26	68
69	68.96	2.41	68.95	2.71	68.93	3.01	68.92	3.31	69
70	69.96	2.44	69.95	2.75	69.93	3.05	69.92	3.36	70
71	70.96	2.48	70.95	2.79	70.93	3.10	70.92	3.41	71
72	71.96	2.51	71.94	2.83	71.93	3.14	71.92	3.45	72
73	72.96	2.55	72.94	2.87	72.93	3.18	72.92	3.50	73
74	73.95	2.58	73.94	2.91	73.93	3.23	73.91	3.55	74
75	74.95	2.62	74.94	2.94	74.93	3.27	74.91	3.60	75
76	75.95	2.65	75.94	2.98	75.93	3.32	75.91	3.65	76
77	76.95	2.69	76.94	3.02	76.93	3.36	76.91	3.69	77
78	77.95	2.72	77.94	3.06	77.93	3.40	77.91	3.74	78
79	78.95	2.76	78.94	3.10	78.92	3.45	78.91	3.79	79
80	79.95	2.79	79.94	3.14	79.92	3.49	79.91	3.84	80
81	80.95	2.83	80.94	3.18	80.92	3.53	80.91	3.89	81
82	81.95	2.86	81.94	3.22	81.92	3.58	81.91	3.93	82
83	82.95	2.90	82.94	3.26	82.92	3.62	82.90	3.98	83
84	83.95	2.93	83.94	3.30	83.92	3.66	83.90	4.03	84
85	84.95	2.97	84.93	3.34	84.92	3.71	84.90	4.08	85
86	85.95	3.00	85.93	3.38	85.92	3.75	85.90	4.13	86
87	86.95	3.04	86.93	3.42	86.92	3.79	86.90	4.17	87
88	87.95	3.07	87.93	3.45	87.92	3.84	87.90	4.22	88
89	88.95	3.11	88.93	3.49	88.92	3.88	88.90	4.27	89
90	89.95	3.14	89.93	3.53	89.91	3.93	89.90	4.32	90
91	90.95	3.18	90.93	3.57	90.91	3.97	90.90	4.37	91
92	91.94	3.21	91.93	3.61	91.91	4.01	91.89	4.41	92
93	92.94	3.25	92.93	3.65	92.91	4.06	92.89	4.46	93
94	93.94	3.28	93.93	3.69	93.91	4.10	93.89	4.51	94
95	94.94	3.32	94.93	3.73	94.91	4.14	94.89	4.56	95
96	95.94	3.35	95.93	3.77	95.91	4.19	95.89	4.61	96
97	96.94	3.39	96.93	3.81	96.91	4.23	96.89	4.65	97
98	97.94	3.42	97.92	3.85	97.91	4.27	97.89	4.70	98
99	98.94	3.46	98.92	3.89	98.91	4.32	98.89	4.75	99
100	99.94	3.49	99.92	3.93	99.90	4.36	99.88	4.80	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	88°.		87¾°.		87½°.		87¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	3°.		3¼°.		3½°.		3¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	1.00	0.05	1.00	0.06	1.00	0.06	1.00	0.06	1
2	2.00	0.10	2.00	0.11	2.00	0.12	2.00	0.13	2
3	3.00	0.16	3.00	0.17	2.99	0.18	2.99	0.20	3
4	3.99	0.21	3.99	0.23	3.99	0.24	3.99	0.26	4
5	4.99	0.26	4.99	0.28	4.99	0.31	4.99	0.33	5
6	5.99	0.31	5.99	0.34	5.99	0.37	5.99	0.39	6
7	6.99	0.37	6.99	0.40	6.99	0.43	6.99	0.46	7
8	7.99	0.42	7.99	0.45	7.99	0.49	7.98	0.52	8
9	8.99	0.47	8.99	0.51	8.98	0.55	8.98	0.59	9
10	9.99	0.52	9.98	0.57	9.98	0.61	9.98	0.65	10
11	10.98	0.58	10.98	0.62	10.98	0.67	10.98	0.72	11
12	11.98	0.63	11.98	0.68	11.98	0.73	11.97	0.78	12
13	12.98	0.68	12.98	0.74	12.98	0.79	12.97	0.85	13
14	13.98	0.73	13.98	0.79	13.97	0.85	13.97	0.92	14
15	14.98	0.79	14.98	0.85	14.97	0.92	14.97	0.98	15
16	15.98	0.84	15.97	0.91	15.97	0.98	15.97	1.05	16
17	16.98	0.89	16.97	0.96	16.97	1.04	16.96	1.11	17
18	17.98	0.94	17.97	1.02	17.97	1.10	17.96	1.18	18
19	18.97	0.99	18.97	1.08	18.96	1.16	18.96	1.24	19
20	19.97	1.05	19.97	1.13	19.96	1.22	19.96	1.31	20
21	20.97	1.10	20.97	1.19	20.96	1.28	20.96	1.37	21
22	21.97	1.15	21.96	1.25	21.96	1.34	21.95	1.44	22
23	22.97	1.20	22.96	1.30	22.96	1.40	22.95	1.50	23
24	23.97	1.26	23.96	1.36	23.96	1.47	23.95	1.57	24
25	24.97	1.31	24.96	1.42	24.95	1.53	24.95	1.64	25
26	25.96	1.36	25.96	1.47	25.95	1.59	25.94	1.70	26
27	26.96	1.41	26.96	1.53	26.95	1.65	26.94	1.77	27
28	27.96	1.47	27.95	1.59	27.95	1.71	27.94	1.83	28
29	28.96	1.52	28.95	1.64	28.95	1.77	28.94	1.90	29
30	29.96	1.57	29.95	1.70	29.94	1.83	29.94	1.96	30
31	30.96	1.62	30.95	1.76	30.94	1.89	30.93	2.03	31
32	31.96	1.67	31.95	1.81	31.94	1.95	31.93	2.09	32
33	32.95	1.73	32.95	1.87	32.94	2.01	32.93	2.16	33
34	33.95	1.78	33.95	1.93	33.94	2.08	33.93	2.22	34
35	34.95	1.83	34.94	1.98	34.93	2.14	34.93	2.29	35
36	35.95	1.88	35.94	2.04	35.93	2.20	35.92	2.35	36
37	36.95	1.94	36.94	2.10	36.93	2.26	36.92	2.42	37
38	37.95	1.99	37.94	2.15	37.93	2.32	37.92	2.49	38
39	38.95	2.04	38.94	2.21	38.93	2.38	38.92	2.55	39
40	39.95	2.09	39.94	2.27	39.93	2.44	39.91	2.62	40
41	40.94	2.15	40.93	2.32	40.92	2.50	40.91	2.68	41
42	41.94	2.20	41.93	2.38	41.92	2.56	41.91	2.75	42
43	42.94	2.25	42.93	2.44	42.92	2.63	42.91	2.81	43
44	43.94	2.30	43.93	2.49	43.92	2.69	43.91	2.88	44
45	44.94	2.36	44.93	2.55	44.92	2.75	44.90	2.94	45
46	45.94	2.41	45.93	2.61	45.91	2.81	45.90	3.01	46
47	46.94	2.46	46.92	2.66	46.91	2.87	46.90	3.07	47
48	47.93	2.51	47.92	2.72	47.91	2.93	47.90	3.14	48
49	48.93	2.56	48.92	2.78	48.91	2.99	48.90	3.20	49
50	49.93	2.62	49.92	2.83	49.91	3.05	49.89	3.27	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	87°.		86¾°.		86½°.		86¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	3°.		3¼°.		3½°.		3¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.93	2.67	50.92	2.89	50.90	3.11	50.89	3.34	51
52	51.93	2.72	51.92	2.95	51.90	3.17	51.89	3.40	52
53	52.93	2.77	52.91	3.00	52.90	3.24	52.89	3.47	53
54	53.93	2.83	53.91	3.06	53.90	3.30	53.88	3.53	54
55	54.92	2.88	54.91	3.12	54.90	3.36	54.88	3.60	55
56	55.92	2.93	55.91	3.17	55.90	3.42	55.88	3.66	56
57	56.92	2.98	56.91	3.23	56.89	3.48	56.88	3.73	57
58	57.92	3.04	57.91	3.29	57.89	3.54	57.88	3.79	58
59	58.92	3.09	58.91	3.34	58.89	3.60	58.87	3.86	59
60	59.92	3.14	59.90	3.40	59.89	3.66	59.87	3.92	60
61	60.92	3.19	60.90	3.46	60.89	3.72	60.87	3.99	61
62	61.92	3.24	61.90	3.51	61.88	3.79	61.87	4.05	62
63	62.91	3.30	62.90	3.57	62.88	3.85	62.87	4.12	63
64	63.91	3.35	63.90	3.63	63.88	3.91	63.86	4.19	64
65	64.91	3.40	64.90	3.69	64.88	3.97	64.86	4.25	65
66	65.91	3.45	65.89	3.74	65.88	4.03	65.86	4.32	66
67	66.91	3.51	66.89	3.80	66.88	4.09	66.86	4.38	67
68	67.91	3.56	67.89	3.86	67.87	4.15	67.85	4.45	68
69	68.91	3.61	68.89	3.91	68.87	4.21	68.85	4.51	69
70	69.90	3.66	69.89	3.97	69.87	4.27	69.85	4.58	70
71	70.90	3.72	70.89	4.03	70.87	4.33	70.85	4.64	71
72	71.90	3.77	71.88	4.08	71.87	4.40	71.85	4.71	72
73	72.90	3.82	72.88	4.14	72.86	4.46	72.84	4.77	73
74	73.90	3.87	73.88	4.20	73.86	4.52	73.84	4.84	74
75	74.90	3.93	74.88	4.25	74.86	4.58	74.84	4.91	75
76	75.90	3.98	75.88	4.31	75.86	4.64	75.84	4.97	76
77	76.89	4.03	76.88	4.37	76.86	4.70	76.84	5.04	77
78	77.89	4.08	77.87	4.42	77.85	4.76	77.83	5.10	78
79	78.89	4.13	78.87	4.48	78.85	4.82	78.83	5.17	79
80	79.89	4.19	79.87	4.54	79.85	4.88	79.83	5.23	80
81	80.89	4.24	80.87	4.59	80.85	4.94	80.83	5.30	81
82	81.89	4.29	81.87	4.65	81.85	5.01	81.82	5.36	82
83	82.89	4.34	82.87	4.71	82.85	5.07	82.82	5.43	83
84	83.88	4.40	83.86	4.76	83.84	5.13	83.82	5.49	84
85	84.88	4.45	84.86	4.82	84.84	5.19	84.82	5.56	85
86	85.88	4.50	85.86	4.88	85.84	5.25	85.82	5.62	86
87	86.88	4.55	86.86	4.93	86.84	5.31	86.81	5.69	87
88	87.88	4.61	87.86	4.99	87.84	5.37	87.81	5.76	88
89	88.88	4.66	88.86	5.05	88.83	5.43	88.81	5.82	89
90	89.88	4.71	89.86	5.10	89.83	5.49	89.81	5.89	90
91	90.88	4.76	90.85	5.16	90.83	5.56	90.81	5.95	91
92	91.87	4.81	91.85	5.22	91.83	5.62	91.80	6.02	92
93	92.87	4.87	92.85	5.27	92.83	5.68	92.80	6.08	93
94	93.87	4.92	93.85	5.33	93.82	5.74	93.80	6.15	94
95	94.87	4.97	94.85	5.39	94.82	5.80	94.80	6.21	95
96	95.87	5.02	95.85	5.44	95.82	5.86	95.79	6.28	96
97	96.87	5.08	96.84	5.50	96.82	5.92	96.79	6.34	97
98	97.87	5.13	97.84	5.56	97.82	5.98	97.79	6.41	98
99	98.86	5.18	98.84	5.61	98.82	6.04	98.79	6.47	99
100	99.86	5.23	99.84	5.67	99.81	6.10	99.79	6.54	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	87°.		86¾°.		86½°.		86¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	4°.		4¼°.		4½°.		4¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	1.00	0.07	1.00	0.07	1.00	0.08	1.00	0.08	1
2	2.00	0.14	1.99	0.15	1.99	0.16	1.99	0.17	2
3	2.99	0.21	2.99	0.22	2.99	0.24	2.99	0.25	3
4	3.99	0.28	3.99	0.30	3.99	0.31	3.99	0.33	4
5	4.99	0.35	4.99	0.37	4.98	0.39	4.98	0.41	5
6	5.99	0.42	5.98	0.44	5.98	0.47	5.98	0.50	6
7	6.98	0.49	6.98	0.52	6.98	0.55	6.98	0.58	7
8	7.98	0.56	7.98	0.59	7.98	0.63	7.97	0.66	8
9	8.98	0.63	8.98	0.67	8.97	0.71	8.97	0.75	9
10	9.98	0.70	9.97	0.74	9.97	0.78	9.97	0.83	10
11	10.97	0.77	10.97	0.82	10.97	0.86	10.96	0.91	11
12	11.97	0.84	11.97	0.89	11.96	0.94	11.96	0.99	12
13	12.97	0.91	12.96	0.96	12.96	1.02	12.96	1.08	13
14	13.97	0.98	13.96	1.04	13.96	1.10	13.95	1.16	14
15	14.96	1.05	14.96	1.11	14.95	1.18	14.95	1.24	15
16	15.96	1.12	15.96	1.19	15.95	1.26	15.95	1.32	16
17	16.96	1.19	16.95	1.26	16.95	1.33	16.94	1.41	17
18	17.96	1.26	17.95	1.33	17 94	1.41	17.94	1.49	18
19	18.95	1.33	18.95	1.41	18.94	1.49	18.93	1.57	19
20	19.95	1.40	19.95	1.48	19.94	1.57	19.93	1.66	20
21	20.95	1.46	20.94	1.56	20.94	1.65	20.93	1.74	21
22	21.95	1.53	21.94	1.63	21.93	1.73	21.92	1.82	22
23	22.94	1.60	22.94	1.70	22.93	1.80	22.92	1.90	23
24	23.94	1.67	23.93	1.78	23.93	1.88	23.92	1.99	24
25	24.94	1.74	24.93	1.85	24.92	1.96	24.91	2.07	25
26	25.94	1.81	25.93	1.93	25.92	2.04	25.91	2.15	26
27	26.93	1.88	26.93	2.00	26.92	2.12	26.91	2.24	27
28	27.93	1.95	27.92	2.08	27.91	2.20	27.90	2.32	28
29	28.93	2.02	28.92	2.15	28.91	2.28	28.90	2.40	29
30	29.93	2.09	29.92	2.22	29.91	2.35	29.90	2.48	30
31	30.92	2.16	30.91	2.30	30.90	2.43	30.89	2.57	31
32	31.92	2.23	31.91	2.37	31.90	2.51	31.89	2.65	32
33	32.92	2.30	32.91	2.45	32.90	2.59	32.89	2.73	33
34	33.92	2.37	33.91	2.52	33.90	2.67	33.88	2.82	34
35	34.91	2.44	34.90	2.59	34.89	2.75	34.88	2.90	35
36	35.91	2.51	35.90	2.67	35.89	2.82	35.88	2.98	36
37	36.91	2.58	36.90	2.74	36.89	2.90	36.87	3.06	37
38	37.91	2.65	37.90	2.82	37.88	2.98	37.87	3.15	38
39	38.90	2.72	38.89	2.89	38.88	3.06	38.87	3.23	39
40	39.90	2.79	39.89	2.96	39.88	3.14	39.86	3.31	40
41	40.90	2.86	40.89	3.04	40.87	3.22	40.86	3.40	41
42	41.90	2.93	41.88	3.11	41.87	3.30	41.86	3.48	42
43	42.90	3.00	42.88	3.19	42.87	3.37	42.85	3.56	43
44	43.89	3.07	43.88	3.26	43.86	3.45	43.85	3.64	44
45	44.89	3.14	44.88	3.33	44.86	3.53	44.85	3.73	45
46	45.89	3.21	45.87	3.41	45.86	3.61	45.84	3.81	46
47	46.89	3.28	46.87	3.48	46.86	3.69	46.84	3.89	47
48	47.88	3.35	47.87	3.56	47.85	3.77	47.84	3.97	48
49	48.88	3.42	48.87	3.63	48.85	3.84	48.83	4.06	49
50	49.88	3.49	49.86	3.71	49.85	3.92	49.83	4.14	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	86°.		85¾°.		85½°.		85¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	4°.		4¼°.		4½°.		4¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.88	3.56	50.86	3.78	50.84	4.00	50.82	4.22	51
52	51.87	3.63	51.86	3.85	51.84	4.08	51.82	4.31	52
53	52.87	3.70	52.85	3.93	52.84	4.16	52.82	4.39	53
54	53.87	3.77	53.85	4.00	53.83	4.24	53.81	4.47	54
55	54.87	3.84	54.85	4.08	54.83	4.32	54.81	4.55	55
56	55.86	3.91	55.85	4.15	55.83	4.39	55.81	4.64	56
57	56.86	3.98	56.84	4.22	56.82	4.47	56.80	4.72	57
58	57.86	4.05	57.84	4.30	57.82	4.55	57.80	4.80	58
59	58.86	4.12	58.84	4.37	58.82	4.63	58.80	4.89	59
60	59.85	4.19	59.84	4.45	59.82	4.71	59.79	4.97	60
61	60.85	4.26	60.83	4.52	60.81	4.79	60.79	5.05	61
62	61.85	4.32	61.83	4.59	61.81	4.86	61.79	5.13	62
63	62.85	4.39	62.83	4.67	62.81	4.94	62.78	5.22	63
64	63.84	4.46	63.82	4.74	63.80	5.02	63.78	5.30	64
65	64.84	4.53	64.82	4.82	64.80	5.10	64.78	5.38	65
66	65.84	4.60	65.82	4.89	65.80	5.18	65.77	5.47	66
67	66.84	4.67	66.82	4.97	66.79	5.26	66.77	5.55	67
68	67.83	4.74	67.81	5.04	67.79	5.34	67.77	5.63	68
69	68.83	4.81	68.81	5.11	68.79	5.41	68.76	5.71	69
70	69.83	4.88	69.81	5.19	69.78	5.49	69.76	5.80	70
71	70.83	4.95	70.80	5.26	70.78	5.57	70.76	5.88	71
72	71.82	5.02	71.80	5.34	71.78	5.65	71.75	5.96	72
73	72.82	5.09	72.80	5.41	72.77	5.73	72.75	6.04	73
74	73.82	5.16	73.80	5.48	73.77	5.81	73.75	6.13	74
75	74.82	5.23	74.79	5.56	74.77	5.88	74.74	6.21	75
76	75.81	5.30	75.79	5.63	75.77	5.96	75.74	6.29	76
77	76.81	5.37	76.79	5.71	76.76	6.04	76.74	6.38	77
78	77.81	5.44	77.79	5.78	77.76	6.12	77.73	6.46	78
79	78.81	5.51	78.78	5.85	78.76	6.20	78.73	6.54	79
80	79.81	5.58	79.78	5.93	79.75	6.28	79.73	6.62	80
81	80.80	5.65	80.78	6.00	80.75	6.36	80.72	6.71	81
82	81.80	5.72	81.77	6.08	81.75	6.43	81.72	6.79	82
83	82.80	5.79	82.77	6.15	82.74	6.51	82.71	6.87	83
84	83.80	5.86	83.77	6.23	83.74	6.59	83.71	6.96	84
85	84.79	5.93	84.77	6.30	84.74	6.67	84.71	7.04	85
86	85.79	6.00	85.76	6.37	85.73	6.75	85.70	7.12	86
87	86.79	6.07	86.76	6.45	86.73	6.83	86.70	7.20	87
88	87.79	6.14	87.76	6.52	87.73	6.90	87.70	7.29	88
89	88.78	6.21	88.76	6.60	88.73	6.98	88.69	7.37	89
90	89.78	6.28	89.75	6.67	89.72	7.06	89.69	7.45	90
91	90.78	6.35	90.75	6.74	90.72	7.14	90.69	7.54	91
92	91.78	6.42	91.75	6.82	91.72	7.22	91.68	7.62	92
93	92.77	6.49	92.74	6.89	92.71	7.30	92.68	7.70	93
94	93.77	6.56	93.74	6.97	93.71	7.38	93.68	7.78	94
95	94.77	6.63	94.74	7.04	94.71	7.45	94.67	7.87	95
96	95.77	6.70	95.74	7.11	95.70	7.53	95.67	7.95	96
97	96.76	6.77	96.73	7.19	96.70	7.61	96.67	8.03	97
98	97.76	6.84	97.73	7.26	97.70	7.69	97.66	8.12	98
99	98.76	6.91	98.73	7.34	98.69	7.77	98.66	8.20	99
100	99.76	6.98	99.73	7.41	99.69	7.85	99.66	8.28	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance
	86°.		85¾°.		85½°.		85¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	5°.		5¼°.		5½°.		5¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	1.00	0.09	1.00	0.09	1.00	0.10	0.99	0.10	1
2	1.99	0.17	1.99	0.18	1.99	0.19	1.99	0.20	2
3	2.99	0.26	2.99	0.27	2.99	0.29	2.98	0.30	3
4	3.98	0.35	3.98	0.37	3.98	0.38	3.98	0.40	4
5	4.98	0.44	4.98	0.46	4.98	0.48	4.97	0.50	5
6	5.98	0.52	5.97	0.55	5.97	0.58	5.97	0.60	6
7	6.97	0.61	6.97	0.64	6.97	0.67	6.96	0.70	7
8	7.97	0.70	7.97	0.73	7.96	0.77	7.96	0.80	8
9	8.97	0.78	8.96	0.82	8.96	0.86	8.95	0.90	9
10	9.96	0.87	9.96	0.92	9.95	0.96	9.95	1.00	10
11	10.96	0.96	10.95	1.01	10.95	1.05	10.94	1.10	11
12	11.95	1.05	11.95	1.10	11.94	1.15	11.94	1.20	12
13	12.95	1.13	12.95	1.19	12.94	1.25	12.93	1.30	13
14	13.95	1.22	13.94	1.28	13.94	1.34	13.93	1.40	14
15	14.94	1.31	14.94	1.37	14.93	1.44	14.92	1.50	15
16	15.94	1.39	15.93	1.46	15.93	1.53	15.92	1.60	16
17	16.94	1.48	16.93	1.56	16.92	1.63	16.91	1.70	17
18	17.93	1.57	17.92	1.65	17.92	1.73	17.91	1.80	18
19	18.93	1.66	18.92	1.74	18.91	1.82	18.90	1.90	19
20	19.92	1.74	19.92	1.83	19.91	1.92	19.90	2.00	20
21	20.92	1.83	20.91	1.92	20.90	2.01	20.89	2.10	21
22	21.92	1.92	21.91	2.01	21.90	2.11	21.89	2.20	22
23	22.91	2.00	22.90	2.10	22.89	2.20	22.88	2.30	23
24	23.91	2.09	23.90	2.20	23.89	2.30	23.88	2.40	24
25	24.90	2.18	24.90	2.29	24.88	2.40	24.87	2.50	25
26	25.90	2.27	25.89	2.38	25.88	2.49	25.87	2.60	26
27	26.90	2.35	26.89	2.47	26.88	2.59	26.86	2.71	27
28	27.89	2.44	27.88	2.56	27.87	2.68	27.86	2.81	28
29	28.89	2.53	28.88	2.65	28.87	2.78	28.85	2.91	29
30	29.89	2.61	29.87	2.75	29.86	2.88	29.85	3.01	30
31	30.88	2.70	30.87	2.84	30.86	2.97	30.84	3.11	31
32	31.88	2.79	31.87	2.93	31.85	3.07	31.84	3.21	32
33	32.87	2.88	32.86	3.02	32.85	3.16	32.83	3.31	33
34	33.87	2.96	33.86	3.11	33.84	3.26	33.83	3.41	34
35	34.87	3.05	34.85	3.20	34.84	3.35	34.82	3.51	35
36	35.86	3.14	35.85	3.29	35.83	3.45	35.82	3.61	36
37	36.86	3.22	36.84	3.39	36.83	3.55	36.81	3.71	37
38	37.86	3.31	37.84	3.48	37.83	3.64	37.81	3.81	38
39	38.85	3.40	38.84	3.57	38.82	3.74	38.80	3.91	39
40	39.85	3.49	39.83	3.66	39.82	3.83	39.80	4.01	40
41	40.84	3.57	40.83	3.75	40.81	3.93	40.79	4.11	41
42	41.84	3.66	41.82	3.84	41.81	4.03	41.79	4.21	42
43	42.84	3.75	42.82	3.93	42.80	4.12	42.78	4.31	43
44	43.83	3.83	43.82	4.03	43.80	4.22	43.78	4.41	44
45	44.82	3.92	44.81	4.12	44.79	4.31	44.77	4.51	45
46	45.82	4.01	45.81	4.21	45.79	4.41	45.77	4.61	46
47	46.82	4.10	46.80	4.30	46.78	4.50	46.76	4.71	47
48	47.82	4.18	47.80	4.39	47.78	4.60	47.76	4.81	48
49	48.81	4.27	48.79	4.48	48.77	4.70	48.75	4.91	49
50	49.81	4.36	49.79	4.58	49.77	4.79	49.75	5.01	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	85°.		84¾°.		84½°.		84¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	5°.		5¼°.		5½°.		5¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.81	4.44	50.79	4.67	50.77	4.89	50.74	5.11	51
52	51.80	4.53	51.78	4.76	51.76	4.98	51.74	5.21	52
53	52.80	4.62	52.78	4.85	52.76	5.08	52.73	5.31	53
54	53.79	4.71	53.77	4.94	53.75	5.18	53.73	5.41	54
55	54.79	4.79	54.77	5.03	54.75	5.27	54.72	5.51	55
56	55.79	4.88	55.77	5.12	55.74	5.37	55.72	5.61	56
57	56.78	4.97	56.76	5.22	56.74	5.46	56.71	5.71	57
58	57.78	5.06	57.76	5.31	57.73	5.56	57.71	5.81	58
59	58.78	5.14	58.75	5.40	58.73	5.65	58.70	5.91	59
60	59.77	5.23	59.75	5.49	59.72	5.75	59.70	6.01	60
61	60.77	5.32	60.74	5.58	60.72	5.85	60.69	6.11	61
62	61.76	5.40	61.74	5.67	61.71	5.94	61.69	6.21	62
63	62.76	5.49	62.74	5.76	62.71	6.04	62.68	6.31	63
64	63.76	5.58	63.73	5.86	63.71	6.13	63.68	6.41	64
65	64.75	5.67	64.73	5.95	64.70	6.23	64.67	6.51	65
66	65.75	5.75	65.72	6.04	65.70	6.33	65.67	6.61	66
67	66.75	5.84	66.72	6.13	66.69	6.42	66.66	6.71	67
68	67.74	5.93	67.71	6.22	67.69	6.52	67.66	6.81	68
69	68.74	6.01	68.71	6.31	68.68	6.61	68.65	6.91	69
70	69.73	6.10	69.71	6.41	69.68	6.71	69.65	7.01	70
71	70.73	6.19	70.70	6.50	70.67	6.81	70.64	7.11	71
72	71.73	6.28	71.70	6.59	71.67	6.90	71.64	7.21	72
73	72.72	6.36	72.69	6.68	72.66	7.00	72.63	7.31	73
74	73.72	6.45	73.69	6.77	73.66	7.09	73.63	7.41	74
75	74.71	6.54	74.69	6.86	74.65	7.19	74.62	7.51	75
76	75.71	6.62	75.68	6.95	75.65	7.28	75.62	7.61	76
77	76.71	6.71	76.68	7.05	76.65	7.38	76.61	7.71	77
78	77.70	6.80	77.67	7.14	77.64	7.48	77.61	7.81	78
79	78.70	6.89	78.67	7.23	78.64	7.57	78.60	7.91	79
80	79.70	6.97	79.66	7.32	79.63	7.67	79.60	8.02	80
81	80.69	7.06	80.66	7.41	80.63	7.76	80.59	8.12	81
82	81.69	7.15	81.66	7.50	81.62	7.86	81.59	8.22	82
83	82.68	7.23	82.65	7.59	82.62	7.96	82.58	8.32	83
84	83.68	7.32	83.65	7.69	83.61	8.05	83.58	8.42	84
85	84.68	7.41	84.64	7.78	84.61	8.15	84.57	8.52	85
86	85.67	7.50	85.64	7.87	85.60	8.24	85.57	8.62	86
87	86.67	7.58	86.64	7.96	86.60	8.34	86.56	8.72	87
88	87.67	7.67	87.63	8.05	87.59	8.43	87.56	8.82	88
89	88.66	7.76	88.63	8.14	88.59	8.53	88.55	8.92	89
90	89.66	7.84	89.62	8.24	89.59	8.63	89.55	9.02	90
91	90.65	7.93	90.62	8.33	90.58	8.72	90.54	9.12	91
92	91.65	8.02	91.61	8.42	91.58	8.82	91.54	9.22	92
93	92.65	8.11	92.61	8.51	92.57	8.91	92.53	9.32	93
94	93.64	8.19	93.61	8.60	93.57	9.01	93.53	9.42	94
95	94.64	8.28	94.60	8.69	94.56	9.11	94.52	9.52	95
96	95.63	8.37	95.60	8.78	95.56	9.20	95.52	9.62	96
97	96.63	8.45	96.59	8.88	96.55	9.30	96.51	9.72	97
98	97.63	8.54	97.59	8.97	97.55	9.39	97.51	9.82	98
99	98.62	8.63	98.58	9.06	98.54	9.49	98.50	9.92	99
100	99.62	8.72	99.58	9.15	99.54	9.58	99.50	10.02	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	85°.		84¾°.		84½°.		84¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	6°.		6¼°.		6½°.		6¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.99	0.10	0.99	0.11	0.99	0.11	0.99	0.12	1
2	1.99	0.21	1.99	0.22	1.99	0.23	1.99	0.24	2
3	2.98	0.31	2.98	0.33	2.98	0.34	2.98	0.35	3
4	3.98	0.42	3.98	0.44	3.97	0.45	3.97	0.47	4
5	4.97	0.52	4.97	0.54	4.97	0.57	4.97	0.59	5
6	5.97	0.63	5.96	0.65	5.96	0.68	5.96	0.71	6
7	6.96	0.73	6.96	0.76	6.96	0.79	6.95	0.82	7
8	7.96	0.84	7.95	0.87	7.95	0.91	7.94	0.94	8
9	8.95	0.94	8.95	0.98	8.94	1.02	8.94	1.06	9
10	9.95	1.05	9.94	1.09	9.94	1.13	9.93	1.18	10
11	10.94	1.15	10.93	1.20	10.93	1.25	10.92	1.29	11
12	11.93	1.25	11.93	1.31	11.92	1.36	11.92	1.41	12
13	12.93	1.36	12.92	1.42	12.92	1.47	12.91	1.53	13
14	13.92	1.46	13.92	1.52	13.91	1.58	13.90	1.65	14
15	14.92	1.57	14.91	1.63	14.90	1.70	14.90	1.76	15
16	15.91	1.67	15.90	1.74	15.90	1.81	15.89	1.88	16
17	16.91	1.78	16.90	1.85	16.89	1.92	16.88	2.00	17
18	17.90	1.88	17.89	1.96	17.88	2.04	17.88	2.12	18
19	18.90	1.99	18.89	2.07	18.88	2.15	18.87	2.23	19
20	19.89	2.09	19.88	2.18	19.87	2.26	19.86	2.35	20
21	20.88	2.20	20.88	2.29	20.87	2.38	20.85	2.47	21
22	21.88	2.30	21.87	2.40	21.86	2.49	21.85	2.59	22
23	22.87	2.40	22.86	2.50	22.85	2.60	22.84	2.70	23
24	23.87	2.51	23.86	2.61	23.85	2.72	23.83	2.82	24
25	24.86	2.61	24.85	2.72	24.84	2.83	24.83	2.94	25
26	25.86	2.72	25.85	2.83	25.83	2.94	25.82	3.06	26
27	26.85	2.82	26.84	2.94	26.83	3.06	26.81	3.17	27
28	27.85	2.93	27.83	3.05	27.82	3.17	27.81	3.29	28
29	28.84	3.03	28.83	3.16	28.81	3.28	28.80	3.41	29
30	29.84	3.14	29.82	3.27	29.81	3.40	29.79	3.53	30
31	30.83	3.24	30.82	3.37	30.80	3.51	30.79	3.64	31
32	31.82	3.34	31.81	3.48	31.79	3.62	31.78	3.76	32
33	32.82	3.45	32.80	3.59	32.79	3.74	32.77	3.88	33
34	33.81	3.55	33.80	3.70	33.78	3.85	33.76	4.00	34
35	34.81	3.66	34.79	3.81	34.78	3.96	34.76	4.11	35
36	35.80	3.76	35.79	3.92	35.77	4.08	35.75	4.23	36
37	36.80	3.87	36.78	4.03	36.76	4.19	36.74	4.35	37
38	37.79	3.97	37.77	4.14	37.76	4.30	37.74	4.47	38
39	38.79	4.08	38.77	4.25	38.75	4.41	38.73	4.58	39
40	39.78	4.18	39.76	4.35	39.74	4.53	39.72	4.70	40
41	40.78	4.29	40.76	4.46	40.74	4.64	40.72	4.82	41
42	41.77	4.39	41.75	4.57	41.73	4.75	41.71	4.94	42
43	42.76	4.49	42.74	4.68	42.72	4.87	42.70	5.05	43
44	43.76	4.60	43.74	4.79	43.72	4.98	43.70	5.17	44
45	44.75	4.70	44.73	4.90	44.71	5.09	44.69	5.29	45
46	45.75	4.81	45.73	5.01	45.70	5.21	45.68	5.41	46
47	46.74	4.91	46.72	5.12	46.70	5.32	46.67	5.52	47
48	47.74	5.02	47.71	5.23	47.69	5.43	47.67	5.64	48
49	48.73	5.12	48.71	5.33	48.69	5.55	48.66	5.76	49
50	49.73	5.23	49.70	5.44	49.68	5.66	49.65	5.88	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	84°.		83¾°.		83½°.		83¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	6°.		6¼°.		6½°.		6¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.72	5.33	50.70	5.55	50.67	5.77	50.65	5.99	51
52	51.72	5.44	51.69	5.66	51.67	5.89	51.64	6.11	52
53	52.71	5.54	52.68	5.77	52.66	6.00	52.63	6.23	53
54	53.70	5.64	53.68	5.88	53.65	6.11	53.63	6.35	54
55	54.70	5.75	54.67	5.99	54.65	6.23	54.62	6.46	55
56	55.69	5.85	55.67	6.10	55.64	6.34	55.61	6.58	56
57	56.69	5.96	56.66	6.21	56.63	6.45	56.60	6.70	57
58	57.68	6.06	57.66	6.31	57.63	6.57	57.60	6.82	58
59	58.68	6.17	58.65	6.42	58.62	6.68	58.59	6.93	59
60	59.67	6.27	59.64	6.53	59.61	6.79	59.58	7.05	60
61	60.67	6.38	60.64	6.64	60.61	6.91	60.58	7.17	61
62	61.66	6.48	61.63	6.75	61.60	7.02	61.57	7.29	62
63	62.65	6.59	62.63	6.86	62.60	7.13	62.56	7.40	63
64	63.65	6.69	63.62	6.97	63.59	7.25	63.56	7.52	64
65	64.64	6.79	64.61	7.08	64.58	7.36	64.55	7.64	65
66	65.64	6.90	65.61	7.19	65.58	7.47	65.54	7.76	66
67	66.63	7.00	66.60	7.29	66.57	7.58	66.54	7.88	67
68	67.63	7.11	67.60	7.40	67.56	7.70	67.53	7.99	68
69	68.62	7.21	68.59	7.51	68.56	7.81	68.52	8.11	69
70	69.62	7.32	69.58	7.62	69.55	7.92	69.51	8.23	70
71	70.61	7.42	70.58	7.73	70.54	8.04	70.51	8.35	71
72	71.61	7.53	71.57	7.84	71.54	8.15	71.50	8.46	72
73	72.60	7.63	72.57	7.95	72.53	8.26	72.49	8.58	73
74	73.59	7.74	73.56	8.06	73.52	8.38	73.49	8.70	74
75	74.59	7.84	74.55	8.17	74.52	8.49	74.48	8.82	75
76	75.58	7.94	75.55	8.27	75.51	8.60	75.47	8.93	76
77	76.58	8.05	76.54	8.38	76.51	8.72	76.47	9.05	77
78	77.57	8.15	77.54	8.49	77.50	8.83	77.46	9.17	78
79	78.57	8.26	78.53	8.60	78.49	8.94	78.45	9.29	79
80	79.56	8.36	79.53	8.71	79.49	9.06	79.45	9.40	80
81	80.56	8.47	80.52	8.82	80.48	9.17	80.44	9.52	81
82	81.55	8.57	81.51	8.93	81.47	9.28	81.43	9.64	82
83	82.55	8.68	82.51	9.04	82.47	9.40	82.42	9.76	83
84	83.54	8.78	83.50	9.14	83.46	9.51	83.42	9.87	84
85	84.53	8.88	84.50	9.25	84.45	9.62	84.41	9.99	85
86	85.53	8.99	85.49	9.36	85.45	9.74	85.40	10.11	86
87	86.52	9.09	86.48	9.47	86.44	9.85	86.40	10.23	87
88	87.52	9.20	87.48	9.58	87.43	9.96	87.39	10.34	88
89	88.51	9.30	88.47	9.69	88.43	10.08	88.38	10.46	89
90	89.51	9.41	89.47	9.80	89.42	10.19	89.38	10.58	90
91	90.50	9.51	90.46	9.91	90.42	10.30	90.37	10.70	91
92	91.50	9.62	91.45	10.02	91.41	10.41	91.36	10.81	92
93	92.49	9.72	92.45	10.12	92.40	10.53	92.36	10.93	93
94	93.49	9.83	93.44	10.23	93.40	10.64	93.35	11.05	94
95	94.48	9.93	94.44	10.34	94.39	10.75	94.34	11.17	95
96	95.47	10.03	95.43	10.45	95.38	10.87	95.33	11.28	96
97	96.47	10.14	96.42	10.56	96.38	10.98	96.33	11.40	97
98	97.46	10.24	97.42	10.67	97.37	11.09	97.32	11.52	98
99	98.46	10.35	98.41	10.78	98.36	11.21	98.31	11.64	99
100	99.45	10.45	99.41	10.89	99.36	11.32	99.31	11.75	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	84°.		83¾°.		83½°.		83¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	7°.		7¼°.		7½°.		7¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.99	0.12	0.99	0.13	0.99	0.13	0.99	0.13	1
2	1.99	0.24	1.98	0.25	1.98	0.26	1.98	0.27	2
3	2.98	0.37	2.98	0.38	2.97	0.39	2.97	0.40	3
4	3.97	0.49	3.97	0.50	3.97	0.52	3.96	0.54	4
5	4.96	0.61	4.96	0.63	4.96	0.65	4.95	0.67	5
6	5.96	0.73	5.95	0.76	5.95	0.78	5.95	0.81	6
7	6.95	0.85	6.94	0.88	6.94	0.91	6.94	0.94	7
8	7.94	0.97	7.94	1.01	7.93	1.04	7.93	1.08	8
9	8.93	1.10	8.93	1.14	8.92	1.17	8.92	1.21	9
10	9.93	1.22	9.92	1.26	9.91	1.31	9.91	1.35	10
11	10.92	1.34	10.91	1.39	10.91	1.44	10.90	1.48	11
12	11.91	1.46	11.90	1.51	11.90	1.57	11.89	1.62	12
13	12.90	1.58	12.90	1.64	12.89	1.70	12.88	1.75	13
14	13.90	1.71	13.89	1.77	13.88	1.83	13.87	1.89	14
15	14.89	1.83	14.88	1.89	14.87	1.96	14.86	2.02	15
16	15.88	1.95	15.87	2.02	15.86	2.09	15.85	2.16	16
17	16.87	2.07	16.86	2.15	16.85	2.22	16.84	2.29	17
18	17.87	2.19	17.86	2.27	17.85	2.35	17.84	2.43	18
19	18.86	2.32	18.85	2.40	18.84	2.48	18.83	2.56	19
20	19.85	2.44	19.84	2.52	19.83	2.61	19.82	2.70	20
21	20.84	2.56	20.83	2.65	20.82	2.74	20.81	2.83	21
22	21.84	2.68	21.82	2.78	21.81	2.87	21.80	2.97	22
23	22.83	2.80	22.82	2.90	22.80	3.00	22.79	3.10	23
24	23.82	2.92	23.81	3.03	23.79	3.13	23.78	3.24	24
25	24.81	3.05	24.80	3.15	24.79	3.26	24.77	3.37	25
26	25.81	3.17	25.79	3.28	25.78	3.39	25.76	3.51	26
27	26.80	3.29	26.78	3.41	26.77	3.52	26.75	3.64	27
28	27.79	3.41	27.78	3.53	27.76	3.65	27.74	3.78	28
29	28.78	3.53	28.77	3.66	28.75	3.79	28.74	3.91	29
30	29.78	3.66	29.76	3.79	29.74	3.92	29.73	4.05	30
31	30.77	3.78	30.75	3.91	30.73	4.05	30.72	4.18	31
32	31.76	3.90	31.74	4.04	31.73	4.18	31.71	4.32	32
33	32.75	4.02	32.74	4.16	32.72	4.31	32.70	4.45	33
34	33.75	4.14	33.73	4.29	33.71	4.44	33.69	4.58	34
35	34.74	4.27	34.72	4.42	34.70	4.57	34.68	4.72	35
36	35.73	4.39	35.71	4.54	35.69	4.70	35.67	4.85	36
37	36.72	4.51	36.70	4.67	36.68	4.83	36.66	4.99	37
38	37.72	4.63	37.70	4.80	37.67	4.96	37.65	5.12	38
39	38.71	4.75	38.69	4.92	38.67	5.09	38.64	5.26	39
40	39.70	4.87	39.68	5.05	39.66	5.22	39.63	5.39	40
41	40.69	5.00	40.67	5.17	40.65	5.35	40.63	5.53	41
42	41.69	5.12	41.66	5.30	41.64	5.48	41.62	5.66	42
43	42.68	5.24	42.66	5.43	42.63	5.61	42.61	5.80	43
44	43.67	5.36	43.65	5.55	43.62	5.74	43.60	5.93	44
45	44.67	5.48	44.64	5.68	44.62	5.87	44.59	6.07	45
46	45.66	5.61	45.63	5.81	45.61	6.00	45.58	6.20	46
47	46.65	5.73	46.62	5.93	46.60	6.13	46.57	6.34	47
48	47.64	5.85	47.62	6.06	47.59	6.27	47.56	6.47	48
49	48.63	5.97	48.61	6.18	48.58	6.40	48.55	6.61	49
50	49.63	6.09	49.60	6.31	49.57	6.53	49.54	6.74	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	83°.		82¾°.		82½°.		82¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	7°.		7¼°.		7½°.		7¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50. 62	6. 22	50. 59	6. 44	50. 56	6. 66	50. 53	6. 88	51
52	51. 61	6. 34	51. 58	6. 56	51. 56	6. 79	51. 53	7. 01	52
53	52. 60	6. 46	52. 58	6. 69	52. 55	6. 92	52. 52	7. 15	53
54	53. 60	6. 58	53. 57	6. 81	53. 54	7. 05	53. 51	7. 28	54
55	54. 59	6. 70	54. 56	6. 94	54. 53	7. 18	54. 50	7. 42	55
56	55. 58	6. 82	55. 55	7. 07	55. 52	7. 31	55. 49	7. 55	56
57	56. 58	6. 95	56. 54	7. 19	56. 51	7. 44	56. 48	7. 69	57
58	57. 57	7. 07	57. 54	7. 32	57. 50	7. 57	57. 47	7. 82	58
59	58. 56	7. 19	58. 53	7. 45	58. 50	7. 70	58. 46	7. 96	59
60	59. 55	7. 31	59. 52	7. 57	59. 49	7. 83	59. 45	8. 09	60
61	60. 55	7. 43	60. 51	7. 70	60. 48	7. 96	60. 44	8. 23	61
62	61. 54	7. 56	61. 50	7. 82	61. 47	8. 09	61. 43	8. 36	62
63	62. 53	7. 68	62. 50	7. 95	62. 46	8. 22	62. 42	8. 50	63
64	63. 52	7. 80	63. 49	8. 08	63. 45	8. 35	63. 42	8. 63	64
65	64. 52	7. 92	64. 48	8. 20	64. 44	8. 48	64. 41	8. 77	65
66	65. 51	8. 04	65. 47	8. 33	65. 44	8. 61	65. 40	8. 90	66
67	66. 50	8. 17	66. 46	8. 46	66. 43	8. 75	66. 39	9. 04	67
68	67. 49	8. 29	67. 46	8. 58	67. 42	8. 88	67. 38	9 17	68
69	68. 49	8. 41	68. 45	8. 71	68. 41	9. 01	68. 37	9. 30	69
70	69. 48	8. 53	69. 44	8. 83	69. 40	9. 14	69. 36	9. 44	70
71	70. 47	8. 65	70. 43	8. 96	70. 39	9. 27	70. 35	9. 57	71
72	71. 46	8. 77	71. 42	9. 09	71. 38	9. 40	71. 34	9. 71	72
73	72. 46	8. 90	72. 42	9. 21	72. 38	9. 53	72. 33	9. 84	73
74	73. 45	9. 02	73. 41	9. 34	73. 37	9. 66	73. 32	9. 98	74
75	74. 44	9. 14	74. 40	9. 46	74. 36	9. 79	74. 31	10. 11	75
76	75. 43	9. 26	75. 39	9. 59	75. 35	9. 92	75. 31	10. 25	76
77	76. 43	9. 38	76. 38	9. 72	76. 34	10. 05	76. 30	10. 38	77
78	77. 42	9. 51	77. 38	9. 84	77. 33	10. 18	77. 29	10. 52	78
79	78. 41	9. 63	78. 37	9. 97	78. 32	10. 31	78. 28	10. 65	79
80	79. 40	9. 75	79. 36	10. 10	79. 32	10. 44	79. 27	10. 79	80
81	80. 40	9. 87	80. 35	10. 22	80. 31	10. 57	80. 26	10. 92	81
82	81. 39	9. 99	81. 34	10. 35	81. 30	10. 70	81. 25	11. 06	82
83	82. 38	10. 12	82. 34	10. 47	82. 29	10. 83	82. 24	11. 19	83
84	83. 37	10. 24	83. 33	10. 60	83. 28	10. 96	83. 23	11. 33	84
85	84. 37	10. 36	84. 32	10. 73	84. 27	11. 09	84. 22	11. 46	85
86	85. 36	10. 48	85. 31	10. 85	85. 26	11. 23	85. 21	11. 60	86
87	86. 35	10. 60	86. 30	10. 98	86. 26	11. 36	86. 21	11. 73	87
88	87. 34	10. 72	87. 30	11. 11	87. 25	11. 49	87. 20	11. 87	88
89	88. 34	10. 85	88. 29	11. 23	88. 24	11. 62	88. 19	12. 00	89
90	89. 33	10. 97	89. 28	11. 36	89. 23	11. 75	89. 18	12. 14	90
91	90. 32	11. 09	90. 27	11. 48	90. 22	11. 88	90. 17	12. 27	91
92	91. 31	11. 21	91. 26	11. 61	91. 21	12. 01	91. 16	12. 41	92
93	92. 31	11. 33	92. 26	11. 74	92. 20	12. 14	92. 15	12. 54	93
94	93. 30	11. 46	93. 25	11. 86	93. 20	12. 27	93. 14	12. 68	94
95	94. 29	11. 58	94. 24	11. 99	94. 19	12. 40	94. 13	12. 81	95
96	95. 28	11. 70	95. 23	12. 12	95. 18	12. 53	95. 12	12. 95	96
97	96. 28	11. 82	96. 22	12. 24	96. 17	12. 66	96. 11	13. 08	97
98	97. 27	11. 94	97. 22	12. 37	97. 16	12. 79	97. 10	13. 22	98
99	98. 26	12. 07	98. 21	12. 49	98. 15	12. 92	98. 10	13. 35	99
100	99. 25	12. 19	99. 20	12. 62	99. 14	13. 05	99. 09	13. 49	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	83°.		82¾°.		82½°.		82¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	8°.		8¼°.		8½°.		8¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.99	0.14	0.99	0.14	0.99	0.15	0.99	0.15	1
2	1.98	0.28	1.98	0.29	1.98	0.30	1.98	0.30	2
3	2.97	0.42	2.97	0.43	2.97	0.44	2.97	0.46	3
4	3.96	0.56	3.96	0.57	3.96	0.59	3.95	0.61	4
5	4.95	0.70	4.95	0.72	4.95	0.74	4.94	0.76	5
6	5.94	0.84	5.94	0.86	5.93	0.89	5.93	0.91	6
7	6.93	0.97	6.93	1.00	6.92	1.03	6.92	1.06	7
8	7.92	1.11	7.92	1.15	7.91	1.18	7.91	1.22	8
9	8.91	1.25	8.91	1.29	8.90	1.33	8.90	1.37	9
10	9.90	1.39	9.90	1.43	9.89	1.48	9.88	1.52	10
11	10.89	1.53	10.89	1.58	10.88	1.63	10.87	1.67	11
12	11.88	1.67	11.88	1.72	11.87	1.77	11.86	1.83	12
13	12.87	1.81	12.87	1.87	12.86	1.92	12.85	1.98	13
14	13.86	1.95	13.86	2.01	13.85	2.07	13.84	2.13	14
15	14.85	2.09	14.84	2.15	14.84	2.22	14.83	2.28	15
16	15.84	2.23	15.83	2.30	15.82	2.36	15.81	2.43	16
17	16.83	2.37	16.82	2.44	16.81	2.51	16.80	2.59	17
18	17.82	2.51	17.81	2.58	17.80	2.66	17.79	2.74	18
19	18.82	2.64	18.80	2.73	18.79	2.81	18.78	2.89	19
20	19.81	2.78	19.79	2.87	19.78	2.96	19.77	3.04	20
21	20.80	2.92	20.78	3.01	20.77	3.10	20.76	3.19	21
22	21.79	3.06	21.77	3.16	21.76	3.25	21.74	3.35	22
23	22.78	3.20	22.76	3.30	22.75	3.40	22.73	3.50	23
24	23.77	3.34	23.75	3.44	23.74	3.55	23.72	3.65	24
25	24.76	3.48	24.74	3.59	24.73	3.70	24.71	3.80	25
26	25.75	3.62	25.73	3.73	25.71	3.84	25.70	3.96	26
27	26.74	3.76	26.72	3.87	26.70	3.99	26.69	4.11	27
28	27.73	3.90	27.71	4.02	27.69	4.14	27.67	4.26	28
29	28.72	4.04	28.70	4.16	28.68	4.29	28.66	4.41	29
30	29.71	4.18	29.69	4.30	29.67	4.43	29.65	4.56	30
31	30.70	4.31	30.68	4.45	30.66	4.58	30.64	4.72	31
32	31.69	4.45	31.67	4.59	31.65	4.73	31.63	4.87	32
33	32.68	4.59	32.66	4.74	32.64	4.88	32.62	5.02	33
34	33.67	4.73	33.65	4.88	33.63	5.03	33.60	5.17	34
35	34.66	4.87	34.64	5.02	34.62	5.17	34.59	5.32	35
36	35.65	5.01	35.63	5.17	35.60	5.32	35.58	5.48	36
37	36.64	5.15	36.62	5.31	36.59	5.47	36.57	5.63	37
38	37.63	5.29	37.61	5.45	37.58	5.62	37.56	5.78	38
39	38.62	5.43	38.60	5.60	38.57	5.76	38.55	5.93	39
40	39.61	5.57	39.59	5.74	39.56	5.91	39.53	6.08	40
41	40.60	5.71	40.58	5.88	40.55	6.06	40.52	6.24	41
42	41.59	5.85	41.57	6.03	41.54	6.21	41.51	6.39	42
43	42.58	5.98	42.55	6.17	42.53	6.36	42.50	6.54	43
44	43.57	6.12	43.54	6.31	43.52	6.50	43.49	6.69	44
45	44.56	6.26	44.53	6.46	44.51	6.65	44.48	6.85	45
46	45.55	6.40	45.52	6.60	45.49	6.80	45.46	7.00	46
47	46.54	6.54	46.51	6.74	46.48	6.95	46.45	7.15	47
48	47.53	6.68	47.50	6.89	47.47	7.09	47.44	7.30	48
49	48.52	6.82	48.49	7.03	48.46	7.24	48.43	7.45	49
50	49.51	6.96	49.48	7.17	49.45	7.39	49.42	7.61	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	82°.		81¾°.		81½°.		81¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	8°.		8¼°.		8½°.		8¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.50	7.10	50.47	7.32	50.44	7.54	50.41	7.76	51
52	51.49	7.24	51.46	7.46	51.43	7.69	51.39	7.91	52
53	52.48	7.38	52.45	7.61	52.42	7.83	52.38	8.06	53
54	53.47	7.52	53.44	7.75	53.41	7.98	53.37	8.21	54
55	54.46	7.65	54.43	7.89	54.40	8.13	54.36	8.37	55
56	55.46	7.79	55.42	8.04	55.38	8.28	55.35	8.52	56
57	56.45	7.93	56.41	8.18	56.37	8.43	56.34	8.67	57
58	57.44	8.07	57.40	8.32	57.36	8.57	57.32	8.82	58
59	58.43	8.21	58.39	8.47	58.35	8.72	58.31	8.98	59
60	59.42	8.35	59.38	8.61	59.34	8.87	59.30	9.13	60
61	60.41	8.49	60.37	8.75	60.33	9.02	60.29	9.28	61
62	61.40	8.63	61.36	8.90	61.32	9.16	61.28	9.43	62
63	62.39	8.77	62.35	9.04	62.31	9.31	62.27	9.58	63
64	63.38	8.91	63.34	9.18	63.30	9.46	63.26	9.74	64
65	64.37	9.05	64.33	9.33	64.29	9.61	64.24	9.89	65
66	65.36	9.19	65.32	9.47	65.28	9.76	65.23	10.04	66
67	66.35	9.32	66.31	9.61	66.26	9.90	66.22	10.19	67
68	67.34	9.46	67.30	9.76	67.25	10.05	67.21	10.34	68
69	68.33	9.60	68.29	9.90	68.24	10.20	68.20	10.50	69
70	69.32	9.74	69.28	10.04	69.23	10.35	69.19	10.65	70
71	70.31	9.88	70.27	10.19	70.22	10.49	70.17	10.89	71
72	71.30	10.02	71.25	10.33	71.21	10.64	71.16	10.95	72
73	72.29	10.16	72.24	10.47	72.20	10.79	72.15	11.11	73
74	73.28	10.30	73.23	10.62	73.19	10.94	73.14	11.26	74
75	74.27	10.44	74.22	10.76	74.18	11.09	74.13	11.41	75
76	75.26	10.58	75.21	10.91	75.17	11.23	75.12	11.56	76
77	76.25	10.72	76.20	11.05	76.15	11.38	76.10	11.71	77
78	77.24	10.86	77.19	11.19	77.14	11.53	77.09	11.87	78
79	78.23	10.99	78.18	11.34	78.13	11.68	78.08	12.02	79
80	79.22	11.13	79.17	11.48	79.12	11.82	79.07	12.17	80
81	80.21	11.27	80.16	11.62	80.11	11.97	80.06	12.32	81
82	81.20	11.41	81.15	11.77	81.10	12.12	81.05	12.47	82
83	82.19	11.55	82.14	11.91	82.09	12.27	82.03	12.63	83
84	83.18	11.69	83.13	12.05	83.08	12.42	83.02	12.78	84
85	84.17	11.83	84.12	12.20	84.07	12.56	84.01	12.93	85
86	85.16	11.97	85.11	12.34	85.06	12.71	85.00	13.08	86
87	86.15	12.11	86.10	12.48	86.04	12.86	85.99	13.23	87
88	87.14	12.25	87.09	12.63	87.03	13.01	86.98	13.39	88
89	88.13	12.39	88.08	12.77	88.02	13.16	87.96	13.54	89
90	89.12	12.53	89.07	12.91	89.01	13.30	88.95	13.69	90
91	90.11	12.66	90.06	13.06	90.00	13.45	89.94	13.84	91
92	91.10	12.80	91.05	13.20	90.99	13.60	90.93	14.00	92
93	92.09	12.94	92.04	13.34	91.98	13.75	91.92	14.15	93
94	93.09	13.08	93.03	13.49	92.97	13.89	92.91	14.30	94
95	94.08	13.22	94.02	13.63	93.96	14.04	93.89	14.45	95
96	95.07	13.36	95.01	13.78	94.95	14.19	94.88	14.60	96
97	96.06	13.50	96.00	13.92	95.93	14.34	95.87	14.76	97
98	97.05	13.64	96.99	14.06	96.92	14.49	96.86	14.91	98
99	98.04	13.78	97.98	14.21	97.91	14.63	97.85	15.06	99
100	99.03	13.92	98.97	14.35	98.90	14.78	98.84	15.21	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	82°.		81¾°.		81½°.		81¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	9°.		9¼°.		9½°.		9¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.99	0.16	0.99	0.16	0.99	0.17	0.99	0.17	1
2	1.98	0.31	1.97	0.32	1.97	0.33	1.97	0.34	2
3	2.96	0.47	2.96	0.48	2.96	0.50	2.96	0.51	3
4	3.95	0.63	3.95	0.64	3.95	0.66	3.94	0.68	4
5	4.94	0.78	4.93	0.80	4.93	0.83	4.93	0.85	5
6	5.93	0.94	5.92	0.96	5.92	0.99	5.91	1.02	6
7	6.91	1.10	6.91	1.13	6.90	1.16	6.90	1.19	7
8	7.90	1.25	7.90	1.29	7.89	1.32	7.88	1.35	8
9	8.89	1.41	8.88	1.45	8.88	1.49	8.87	1.52	9
10	9.88	1.56	9.87	1.61	9.86	1.65	9.86	1.69	10
11	10.86	1.72	10.86	1.77	10.85	1.82	10.84	1.86	11
12	11.85	1.88	11.84	1.93	11.84	1.98	11.83	2.03	12
13	12.84	2.03	12.83	2.09	12.82	2.15	12.81	2.20	13
14	13.83	2.19	13.82	2.25	13.81	2.31	13.80	2.37	14
15	14.82	2.35	14.80	2 41	14.79	2.48	14.78	2.54	15
16	15.80	2.50	15.79	2.57	15.78	2.64	15.77	2.71	16
17	16.79	2.66	16.78	2.73	16.77	2.81	16.75	2.88	17
18	17.78	2.82	17.77	2.89	17.75	2.97	17.74	3.05	18
19	18.77	2.97	18.75	3.05	18.74	3.14	18.73	3.22	19
20	19.75	3.13	19.74	3.21	19.73	3.30	19.71	3.39	20
21	20.74	3.29	20.73	3.38	20.71	3.47	20.70	3.56	21
22	21.73	3.44	21.71	3.54	21.70	3.63	21.68	3.73	22
23	22.72	3.60	22.70	3.70	22.68	3.80	22.67	3.90	23
24	23.70	3.75	23.69	3.86	23.67	3.96	23.65	4.06	24
25	24.69	3.91	24.67	4.02	24.66	4.13	24.64	4.23	25
26	25.68	4.07	25.66	4.18	25.64	4.29	25.62	4.40	26
27	26.67	4.22	26.65	4.34	26.63	4.46	26.61	4.57	27
28	27.66	4.38	27.64	4.50	27.62	4.62	27.60	4.74	28
29	28.64	4.54	28.62	4.66	28.60	4.79	28.58	4.91	29
30	29.63	4.69	29.61	4.82	29.59	4.95	29.57	5.08	30
31	30.62	4.85	30.60	4.98	30.57	5.12	30.55	5.25	31
32	31.61	5.01	31.58	5.14	31.56	5.28	31.54	5.42	32
33	32.59	5.16	32.57	5.30	32.55	5.45	32.52	5.59	33
34	33.58	5.32	33.56	5.47	33.53	5.61	33.51	5.76	34
35	34.57	5.48	34.54	5.63	34.52	5.78	34.49	5.93	35
36	35.56	5.63	35.53	5.79	35.51	5.94	35.48	6.10	36
37	36.54	5.79	36.52	5.95	36.49	6.11	36.47	6.27	37
38	37.53	5.94	37.51	6.11	37.48	6.27	37.45	6.44	38
39	38.52	6.10	38.49	6.27	38.47	6.44	38.44	6.60	39
40	39.51	6.26	39.48	6.43	39.45	6.60	39.42	6.77	40
41	40.50	6.41	40.47	6.59	40.44	6.77	40.41	6.94	41
42	41.48	6.57	41.45	6.75	41.42	6.92	41.39	7.11	42
43	42.47	6.73	42.44	6.91	42.41	7.10	42.38	7.28	43
44	43.46	6.88	43.43	7.07	43.40	7.26	43.36	7.45	44
45	44.45	7.04	44.41	7.23	44.38	7.43	44.35	7.62	45
46	45.43	7.20	45.40	7.39	45.37	7.59	45.34	7.79	46
47	46.42	7.35	46.39	7.55	46.36	7.76	46.32	7.96	47
48	47.41	7.51	47.38	7.72	47.34	7.92	47.31	8.13	48
49	48.40	7.67	48.36	7.88	48.33	8.09	48.29	8.30	49
50	49.38	7.82	49.35	8.04	49.32	8.25	49.28	8.47	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	81°.		80¾°.		80½°.		80¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	9°.		9¼°.		9½°.		9¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.37	7.98	50.34	8.20	50.30	8.42	50.26	8.64	51
52	51.36	8.13	51.32	8.36	51.29	8.58	51.25	8.81	52
53	52.35	8.29	52.31	8.52	52.27	8.75	52.23	8.98	53
54	53.34	8.45	53.30	8.68	53.26	8.91	53.22	9.14	54
55	54.32	8.60	54.28	8.84	54.25	9.08	54.21	9.31	55
56	55.31	8.76	55.27	9.00	55.23	9.24	55.19	9.48	56
57	56.30	8.92	56.26	9.16	56.22	9.41	56.18	9.65	57
58	57.29	9.07	57.25	9.32	57.20	9.57	57.16	9.82	58
59	58.27	9.23	58.23	9.48	58.19	9.74	58.15	9.99	59
60	59.26	9.39	59.22	9 64	59.18	9.90	59.13	10.16	60
61	60.25	9.54	60.21	9.81	60.16	10.07	60.12	10.33	61
62	61.24	9.70	61.19	9.97	61.15	10.23	61.10	10.50	62
63	62.22	9.86	62.18	10.13	62.14	10.40	62.09	10.67	63
64	63.21	10.01	63.17	10.29	63.12	10.56	63.08	10.84	64
65	64.20	10.17	64.15	10.45	64.11	10.73	64.06	11.01	65
66	65.19	10.32	65.14	10.61	65.09	10.89	65.05	11.18	66
67	66.18	10.48	66.13	10.77	66.08	11.06	66.03	11.35	67
68	67.16	10.64	67.12	10.93	67.07	11.22	67.02	11.52	68
69	68.15	10.79	68.10	11.09	68.05	11.39	68.00	11.69	69
70	69.14	10.95	69.09	11.25	69.04	11.55	68.99	11.85	70
71	70.13	11.11	70.08	11.41	70.03	11.72	69.97	12.02	71
72	71.11	11.26	71.06	11.57	71.01	11.88	70.96	12.19	72
73	72.10	11.42	72.05	11.73	72.00	12.05	71.95	12.36	73
74	73.09	11.58	73.04	11.89	72.99	12.21	72.93	12.53	74
75	74.08	11.73	74.02	12.06	73.97	12.38	73.92	12.70	75
76	75.06	11.89	75.01	12.22	74.96	12.54	74.90	12.87	76
77	76.05	12.05	76.00	12.38	75.94	12.71	75.89	13.04	77
78	77.04	12.20	76.99	12.54	76.93	12.87	76.87	13.21	78
79	78.03	12.36	77.97	12.70	77.92	13.04	77.86	13.38	79
80	79.02	12.51	78.96	12.86	78.90	13.20	78.84	13.55	80
81	80.00	12.67	79.95	13.02	79.89	13.37	79.83	13.72	81
82	80.99	12.83	80.93	13.18	80.88	13.53	80.82	13.89	82
83	81.98	12.98	81.92	13.34	81.86	13.70	81.80	14.06	83
84	82.97	13.14	82.91	13.50	82.85	13.86	82.79	14.23	84
85	83.95	13.30	83.89	13.66	83.83	14.03	83.77	14.39	85
86	84.94	13.45	84.88	13.82	84.82	14.19	84.76	14.56	86
87	85.93	13.61	85.87	13.98	85.81	14.36	85.74	14.73	87
88	86.92	13.77	86.86	14.15	86.79	14.52	86.73	14.90	88
89	87.90	13.92	87.84	14.31	87.78	14.69	87.71	15.07	89
90	88.89	14.08	88.83	14.47	88.77	14.85	88.70	15.24	90
91	89.88	14.24	89.82	14.63	89.75	15.02	89.69	15.41	91
92	90.87	14.39	90.80	14.79	90.74	15.18	90.67	15.58	92
93	91.86	14.55	91.79	14.95	91.72	15.35	91.66	15.75	93
94	92.84	14.70	92.78	15.11	92.71	15.51	92.64	15.92	94
95	93.83	14.86	93.76	15.27	93.70	15.68	93.63	16.09	95
96	94.82	15.02	94.75	15.43	94.68	15.84	94.61	16.26	96
97	95.81	15.17	95.74	15.59	95.67	16.01	95.60	16.43	97
98	96.79	15.33	96.73	15.75	96.66	16.17	96.58	16.60	98
99	97.78	15.49	97.71	15.91	97.64	16.34	97.57	16.77	99
100	98.77	15.64	98.70	16.07	98.63	16.50	98.56	16.93	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	81°.		80¾°.		80½°.		80¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	10°.		10¼°.		10½°.		10¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.98	0.17	0.98	0.18	0.98	0.18	0.98	0.19	1
2	1.97	0.35	1.97	0.36	1.97	0.36	1.96	0.37	2
3	2.95	0.52	2.95	0.53	2.95	0.55	2.95	0.56	3
4	3.94	0.69	3.94	0.71	3.93	0.73	3.93	0.75	4
5	4.92	0.87	4.92	0.89	4.92	0.91	4.91	0.93	5
6	5.91	1.04	5.90	1.07	5.90	1.09	5.89	1.12	6
7	6.89	1.22	6.89	1.25	6.88	1.28	6.88	1.31	7
8	7.88	1.39	7.87	1.42	7.87	1.46	7.86	1.49	8
9	8.86	1.56	8.86	1.60	8.85	1.64	8.84	1.68	9
10	9.85	1.74	9.84	1.78	9.83	1.82	9.82	1.87	10
11	10.83	1.91	10.82	1.96	10.82	2.00	10.81	2.05	11
12	11.82	2.08	11.81	2.14	11.80	2.19	11.79	2.24	12
13	12.80	2.26	12.79	2.31	12.78	2.37	12.77	2.42	13
14	13.79	2.43	13.78	2.49	13.77	2.55	13.75	2.61	14
15	14.77	2.60	14.76	2.67	14.75	2.73	14.74	2.80	15
16	15.76	2.78	15.74	2.85	15.73	2.92	15.72	2.98	16
17	16.74	2.95	16.73	3.03	16.72	3.10	16.70	3.17	17
18	17.73	3.13	17.71	3.20	17.70	3.28	17.68	3.36	18
19	18.71	3.30	18.70	3.38	18.68	3.46	18.67	3.54	19
20	19.70	3.47	19.68	3.56	19.67	3.64	19.65	3.73	20
21	20.68	3.65	20.66	3.74	20.65	3.83	20.63	3.92	21
22	21.67	3.82	21.65	3.91	21.63	4.01	21.61	4.10	22
23	22.65	3.99	22.63	4.09	22.61	4.19	22.60	4.29	23
24	23.64	4.17	23.62	4.27	23.60	4.37	23.58	4.48	24
25	24.62	4.34	24.60	4.45	24.58	4.56	24.56	4.66	25
26	25.61	4.51	25.59	4.63	25.56	4.74	25.54	4.85	26
27	26.59	4.69	26.57	4.80	26.55	4.92	26.53	5.04	27
28	27.57	4.86	27.55	4.98	27.53	5.10	27.51	5.22	28
29	28.56	5.04	28.54	5.16	28.51	5.28	28.49	5.41	29
30	29.54	5.21	29.52	5.34	29.50	5.47	29.47	5.60	30
31	30.53	5.38	30.51	5.52	30.48	5.65	30.46	5.78	31
32	31.51	5.56	31.49	5.69	31.46	5.83	31.44	5.97	32
33	32.50	5.73	32.47	5.87	32.45	6.01	32.42	6.16	33
34	33.48	5.90	33.46	6.05	33.43	6.20	33.40	6.34	34
35	34.47	6.08	34.44	6.23	34.41	6.38	34.39	6.53	35
36	35.45	6.25	35.43	6.41	35.40	6.56	35.37	6.71	36
37	36.44	6.42	36.41	6.58	36.38	6.74	36.35	6.90	37
38	37.42	6.60	37.39	6.76	37.36	6.92	37.33	7.09	38
39	38.41	6.77	38.38	6.94	38.35	7.11	38.32	7.27	39
40	39.39	6.95	39.36	7.12	39.33	7.29	39.30	7.46	40
41	40.38	7.12	40.35	7.30	40.31	7.47	40.28	7.65	41
42	41.36	7.29	41.33	7.47	41.30	7.65	41.26	7.83	42
43	42.35	7.47	42.31	7.65	42.28	7.84	42.25	8.02	43
44	43.33	7.64	43.30	7.83	43.26	8.02	43.23	8.21	44
45	44.32	7.81	44.28	8.01	44.25	8.20	44.21	8.39	45
46	45.30	7.99	45.27	8.19	45.23	8.38	45.19	8.58	46
47	46.29	8.16	46.25	8.36	46.21	8.57	46.18	8.77	47
48	47.27	8.34	47.23	8.54	47.20	8.75	47.16	8.95	48
49	48.26	8.51	48.22	8.72	48.18	8.93	48.14	9.14	49
50	49.24	8.68	49.20	8.90	49.16	9.11	49.12	9.33	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	80°.		79¾°.		79½°.		79¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	10°.		10¼°.		10½°.		10¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.23	8.86	50.19	9.08	50.15	9.29	50.10	9.51	51
52	51.21	9.03	51.17	9.25	51.13	9.48	51.09	9.70	52
53	52.19	9.20	52.15	9.43	52.11	9.66	52.07	9.89	53
54	53.18	9.38	53.14	9.61	53.10	9.84	53.05	10.07	54
55	54.16	9.55	54.12	9.79	54.08	10.02	54.03	10.26	55
56	55.15	9.72	55.11	9.96	55.06	10.21	55.02	10.45	56
57	56.13	9 90	56.09	10.14	56.05	10.39	56.00	10.63	57
58	57.12	10.07	57.07	10.32	57.03	10.57	56.98	10.82	58
59	58.10	10.25	58.06	10.50	58.01	10.75	57.96	11.00	59
60	59.09	10.42	59.04	10.68	59.00	10.93	58.95	11.19	60
61	60.07	10.59	60.03	10.85	59.98	11.12	59.93	11.38	61
62	61.06	10.77	61.01	11.03	60.96	11.30	60.91	11.56	62
63	62.04	10.94	61.99	11.21	61.95	11.48	61.89	11.75	63
64	63.03	11.11	62.98	11.39	62.93	11.66	62.88	11.94	64
65	64.01	11.29	63.96	11.57	63.91	11.85	63.86	12.12	65
66	65.00	11.46	64.95	11.74	64.89	12.03	64.84	12.31	66
67	65.98	11.63	65.93	11.92	65.88	12.21	65.82	12.50	67
68	66.97	11.81	66.91	12.10	66.86	12.39	66.81	12.68	68
69	67.95	11.98	67.90	12.28	67.84	12.57	67.79	12.87	69
70	68.94	12.16	68.88	12.46	68.83	12.76	68.77	13.06	70
71	69.92	12.33	69.87	12.63	69.81	12.94	69.75	13.24	71
72	70.91	12.50	70.85	12.81	70.79	13.12	70.74	13.43	72
73	71.89	12.68	71.83	12.99	71.78	13.30	71.72	13.62	73
74	72.88	12.85	72.82	13.17	72.76	13.49	72.70	13.80	74
75	73.86	13.02	73.80	13.35	73.74	13.67	73.68	13.99	75
76	74.85	13.20	74.79	13.52	74.73	13.85	74.67	14.18	76
77	75.83	13.37	75.77	13.70	75.71	14.03	75.65	14.36	77
78	76.82	13.54	76.76	13.88	76.69	14.21	76.63	14.55	78
79	77.80	13.72	77.74	14.06	77.68	14.40	77.61	14.74	79
80	78.78	13.89	78.72	14.24	78.66	14.58	78.60	14.92	80
81	79.77	14.07	79.71	14.41	79.64	14.76	79.58	15.11	81
82	80.75	14.24	80.69	14.59	80.63	14.94	80.56	15.29	82
83	81.74	14.41	81.68	14.77	81.61	15.13	81.54	15.48	83
84	82.72	14.59	82.66	14.95	82.59	15.31	82.53	15.67	84
85	83.71	14.76	83.64	15.13	83.58	15.49	83.51	15.85	85
86	84.69	14.93	84.63	15.30	84.56	15.67	84.49	16.04	86
87	85.68	15.11	85.61	15.48	85.54	15.85	85.47	16.23	87
88	86.66	15.28	86.60	15.66	86.53	16.04	86.46	16.41	88
89	87.65	15.45	87.58	15.84	87.51	16.22	87.44	16.60	89
90	88.63	15.63	88.56	16.01	88.49	16.40	88.42	16.79	90
91	89.62	15.80	89.55	16.19	89.48	16.58	89.40	16.97	91
92	90.60	15.98	90.53	16.37	90.46	16.77	90.39	17.16	92
93	91.59	16.15	91.52	16.55	91.44	16.95	91.37	17.35	93
94	92.57	16.32	92.50	16.73	92.43	17.13	92.35	17.53	94
95	93.56	16.50	93.48	16.90	93.41	17.31	93.33	17.72	95
96	94.54	16.67	94.47	17.08	94.39	17.49	94.32	17.91	96
97	95.53	16.84	95.45	17.26	95.38	17.68	95.30	18.09	97
98	96.51	17.02	96.44	17.44	96.36	17.86	96.28	18.28	98
99	97.50	17.19	97.42	17.62	97.34	18.04	97.26	18.47	99
100	98.48	17.36	98.40	17.79	98.33	18.22	98.25	18.65	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	80°.		79¾°.		79½°.		79¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	11°.		11¼°.		11½°.		11¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.98	0.19	0.98	0.20	0.98	0.20	0.98	0.20	1
2	1.96	0.38	1.96	0.39	1.96	0.40	1.96	0.41	2
3	2.94	0.57	2.94	0.59	2.94	0.60	2.94	0.61	3
4	3.93	0.76	3.92	0.78	3.92	0.80	3.92	0.81	4
5	4.91	0.95	4.90	0.98	4.90	1.00	4.90	1.02	5
6	5.89	1.14	5.88	1.17	5.88	1.20	5.87	1.22	6
7	6.87	1.34	6.87	1.37	6.86	1.40	6.85	1.43	7
8	7.85	1.53	7.85	1.56	7.84	1.59	7.83	1.63	8
9	8.83	1.72	8.83	1.76	8.82	1.79	8.81	1.83	9
10	9.82	1.91	9.81	1.95	9.80	1.99	9.79	2.04	10
11	10.80	2.10	10.79	2.15	10.78	2.19	10.77	2.24	11
12	11.78	2.29	11.77	2.34	11.76	2.39	11.75	2.44	12
13	12.76	2.48	12.75	2.54	12.74	2.59	12.73	2.65	13
14	13.74	2.67	13.73	2.73	13.72	2.79	13.71	2.85	14
15	14.72	2.86	14.71	2.93	14.70	2.99	14.69	3.05	15
16	15.71	3.05	15.69	3.12	15.68	3.19	15.66	3.26	16
17	16.69	3.24	16.67	3.32	16.66	3.39	16.64	3.46	17
18	17.67	3.43	17.65	3.51	17.64	3.59	17.62	3.66	18
19	18.65	3.63	18.63	3.71	18.62	3.79	18.60	3.87	19
20	19.63	3.82	19.62	3.90	19.60	3.99	19.58	4.07	20
21	20.61	4.01	20.60	4.10	20.58	4.19	20.56	4.28	21
22	21.60	4.20	21.58	4.29	21.56	4.39	21.54	4.48	22
23	22.58	4.39	22.56	4.49	22.54	4.59	22.52	4.68	23
24	23.56	4.58	23.54	4.68	23.52	4.78	23.50	4.89	24
25	24.54	4.77	24.52	4.88	24.50	4.98	24.48	5.09	25
26	25.52	4.96	25.50	5.07	25.48	5.18	25.46	5.29	26
27	26.50	5.15	26.48	5.27	26.46	5.38	26.43	5.50	27
28	27.49	5.34	27.46	5.46	27.44	5.58	27.41	5.70	28
29	28.47	5.53	28.44	5.66	28.42	5.78	28.39	5.91	29
30	29.45	5.72	29.42	5.85	29.40	5.98	29.37	6.11	30
31	30.43	5.92	30.40	6.05	30.38	6.18	30.35	6.31	31
32	31.41	6.11	31.39	6.24	31.36	6.38	31.33	6.52	32
33	32.39	6.30	32.37	6.44	32.34	6.58	32.31	6.72	33
34	33.38	6.49	33.35	6.63	33.32	6.78	33.29	6.92	34
35	34.36	6.68	34.33	6.83	34.30	6.98	34.27	7.13	35
36	35.34	6.87	35.31	7.02	35.28	7.18	35.25	7.33	36
37	36.32	7.06	36.29	7.22	36.26	7.38	36.22	7.53	37
38	37.30	7.25	37.27	7.41	37.24	7.58	37.20	7.74	38
39	38.28	7.44	38.25	7.61	38.22	7.78	38.18	7.94	39
40	39.27	7.63	39.23	7.80	39.20	7.97	39.16	8.15	40
41	40.25	7.82	40.21	8.00	40.18	8.17	40.14	8.35	41
42	41.23	8.01	41.19	8.19	41.16	8.37	41.12	8.55	42
43	42.21	8.20	42.17	8.39	42.14	8.57	42.10	8.76	43
44	43.19	8.40	43.15	8.58	43.12	8.77	43.08	8.96	44
45	44.17	8.59	44.14	8.78	44.10	8.97	44.06	9.16	45
46	45.15	8.78	45.12	8.97	45.08	9.17	45.04	9.37	46
47	46.14	8.97	46.10	9.17	46.06	9.37	46.02	9.57	47
48	47.12	9.16	47.08	9.36	47.04	9.57	46.99	9.77	48
49	48.10	9.35	48.06	9.56	48.02	9.77	47.97	9.98	49
50	49.08	9.54	49.04	9.75	49.00	9.97	48.95	10.18	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	79°.		78¾°.		78½°.		78¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	11°.		11¼°.		11½°.		11¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	50.06	9.73	50.02	9.95	49.98	10.17	49.93	10.39	51
52	51.04	9.92	51.00	10.14	50.96	10.37	50.91	10.59	52
53	52.03	10.11	51.98	10.34	51.94	10.57	51.89	10.79	53
54	53.01	10.30	52.96	10.53	52.92	10.77	52.87	11.00	54
55	53.99	10.49	53.94	10.73	53.90	10.97	53.85	11.20	55
56	54.97	10.69	54.92	10.93	54.88	11.16	54.83	11.40	56
57	55.95	10.88	55.90	11.12	55.86	11.36	55.81	11.61	57
58	56.93	11.07	56.89	11.32	56.84	11.56	56.78	11.81	58
59	57.92	11.26	57.87	11.51	57.82	11.76	57.76	12.01	59
60	58.90	11.45	58.85	11.71	58.80	11.96	58.74	12.22	60
61	59.88	11.64	59.83	11.90	59.78	12.16	59.72	12.42	61
62	60.86	11.83	60.81	12.10	60.76	12.36	60.70	12.63	62
63	61.84	12.02	61.79	12.29	61.74	12.56	61.68	12.83	63
64	62.82	12.21	62.77	12.49	62.72	12.76	62.66	13.03	64
65	63.81	12.40	63.75	12.68	63.70	12.96	63.64	13.24	65
66	64.79	12.59	64.73	12.88	64.68	13.16	64.62	13.44	66
67	65.77	12.78	65.71	13.07	65.65	13.36	65.60	13.64	67
68	66.75	12.98	66.69	13.27	66.63	13.56	66.58	13.85	68
69	67.73	13.17	67.67	13.46	67.61	13.76	67.55	14.05	69
70	68.71	13.36	68.65	13.66	68.59	13.96	68.53	14.25	70
71	69.70	13.55	69.64	13.85	69.57	14.16	69.51	14.46	71
72	70.68	13.74	70.62	14.05	70.55	14.35	70.49	14.66	72
73	71.66	13.93	71.60	14.24	71.53	14.55	71.47	14.87	73
74	72.64	14.12	72.58	14.44	72.51	14.75	72.45	15.07	74
75	73.62	14.31	73.56	14.63	73.49	14.95	73.43	15.27	75
76	74.60	14.50	74.54	14.83	74.47	15.15	74.41	15.48	76
77	75.59	14.69	75.52	15.02	75.45	15.35	75.39	15.68	77
78	76.57	14.88	76.50	15.22	76.43	15.55	76.37	15.88	78
79	77.55	15.07	77.48	15.41	77.41	15.75	77.34	16.09	79
80	78.53	15.26	78.46	15.61	78.39	15.95	78.32	16.29	80
81	79.51	15.46	79.44	15.80	79.37	16.15	79.30	16.49	81
82	80.49	15.65	80.42	16.00	80.35	16.35	80.28	16.70	82
83	81.48	15.84	81.41	16.19	81.33	16.55	81.26	16.90	83
84	82.46	16.03	82.39	16.39	82.31	16.75	82.24	17.11	84
85	83.44	16.22	83.37	16.58	83.29	16.95	83.22	17.31	85
86	84.42	16.41	84.35	16.78	84.27	17.15	84.20	17.51	86
87	85.40	16.60	85.33	16.97	85.25	17.35	85.18	17.72	87
88	86.38	16.79	86.31	17.17	86.23	17.54	86.16	17.92	88
89	87.36	16.98	87.29	17.36	87.21	17.74	87.14	18.12	89
90	88.35	17.17	88.27	17.56	88.19	17.94	88.11	18.33	90
91	89.33	17.36	89.25	17.75	89.17	18.14	89.09	18.53	91
92	90.31	17.55	90.23	17.95	90.15	18.34	90.07	18.74	92
93	91.29	17.75	91.21	18.14	91.13	18.54	91.05	18.94	93
94	92.27	17.94	92.19	18.34	92.11	18.74	92.03	19.14	94
95	93.25	18.13	93.17	18.53	93.09	18.94	93.01	19.35	95
96	94.24	18.32	94.16	18.73	94.07	19.14	93.99	19.55	96
97	95.22	18.51	95.14	18.92	95.05	19.34	94.97	19.75	97
98	96.20	18.70	96.12	19.12	96.03	19.54	95.95	19.96	98
99	97.18	18.89	97.10	19.31	97.01	19.74	96.93	20.16	99
100	98.16	19.08	98.08	19.51	97.99	19.94	97.90	20.36	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	79°.		78¾°.		78½°.		78¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	12°.		12¼°.		12½°.		12¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.98	0.21	0.98	0.21	0.98	0.22	0.98	0.22	1
2	1.96	0.42	1.95	0.42	1.95	0.43	1.95	0.44	2
3	2.93	0.62	2.93	0.64	2.93	0.65	2.93	0.66	3
4	3.91	0.83	3.91	0.85	3.91	0.87	3.90	0.88	4
5	4.89	1.04	4.89	1.06	4.88	1.08	4.88	1.10	5
6	5.87	1.25	5.86	1.27	5.86	1.30	5.85	1.32	6
7	6.85	1.46	6.84	1.49	6.83	1.52	6.83	1.54	7
8	7.83	1.66	7.82	1.70	7.81	1.73	7.80	1.77	8
9	8.80	1.87	8.80	1.91	8.79	1.95	8.78	1.99	9
10	9.78	2.08	9.77	2.12	9.76	2.16	9.75	2.21	10
11	10.76	2.29	10.75	2.33	10.74	2.38	10.73	2.43	11
12	11.74	2.49	11.73	2.55	11.72	2.60	11.70	2.65	12
13	12.72	2.70	12.70	2.76	12.69	2.81	12.68	2.87	13
14	13.69	2.91	13.68	2.97	13.67	3.03	13.65	3.09	14
15	14.67	3.12	14.66	3.18	14.64	3.25	14.63	3.31	15
16	15.65	3.33	15.64	3.39	15.62	3.46	15.61	3.53	16
17	16.63	3.53	16.61	3.61	16.60	3.68	16.58	3.75	17
18	17.61	3.74	17.59	3.82	17.57	3.90	17.56	3.97	18
19	18.58	3.95	18.57	4.03	18.55	4.11	18.53	4.19	19
20	19.56	4.16	19.54	4.24	19.53	4.33	19.51	4.41	20
21	20.54	4.37	20.52	4.46	20.50	4.55	20.48	4.63	21
22	21.52	4.57	21.50	4.67	21.48	4.76	21.46	4.86	22
23	22.50	4.78	22.48	4.88	22.45	4.98	22.43	5.08	23
24	23.48	4.99	23.45	5.09	23.43	5.19	23.41	5.30	24
25	24.45	5.20	24.43	5.30	24.41	5.41	24.38	5.52	25
26	25.43	5.41	25.41	5.52	25.38	5.63	25.36	5.74	26
27	26.41	5.61	26.39	5.73	26.36	5.84	26.33	5.96	27
28	27.39	5.82	27.36	5.94	27.34	6.06	27.31	6.18	28
29	28.37	6.03	28.34	6.15	28.31	6.28	28.28	6.40	29
30	29.34	6.24	29.32	6.37	29.29	6.49	29.26	6.62	30
31	30.32	6.45	30.29	6.58	30.27	6.71	30.24	6.84	31
32	31 30	6.65	31.27	6.79	31.24	6.93	31.21	7.06	32
33	32.28	6.86	32.25	7.00	32.22	7.14	32.19	7.28	33
34	33.26	7.07	33.23	7.21	33.19	7.36	33.16	7.50	34
35	34.24	7.28	34.20	7.43	34.17	7.58	34.14	7.72	35
36	35.21	7.48	35.18	7.64	35.15	7.79	35.11	7.95	36
37	36.19	7.69	36.16	7.85	36.12	8.01	36.09	8.17	37
38	37.17	7.90	37.13	8.06	37.10	8.22	37.06	8.39	38
39	38.15	8.11	38.11	8.27	38.08	8.44	38.04	8.61	39
40	39.13	8.32	39.09	8.49	39.05	8.66	39.01	8.83	40
41	40.10	8.52	40.07	8.70	40.03	8.87	39.99	9.05	41
42	41.08	8.73	41.04	8.91	41.00	9.09	40.96	9.27	42
43	42.06	8.94	42.02	9.12	41.98	9.31	41.94	9.49	43
44	43.04	9.15	43.00	9.34	42.96	9.52	42.92	9.71	44
45	44.02	9.36	43.98	9.55	43.93	9.74	43.89	9.93	45
46	44.99	9.56	44.95	9.76	44.91	9.96	44.87	10.15	46
47	45.97	9.77	45.93	9.97	45.89	10.17	45.84	10.37	47
48	46.95	9.98	46.91	10.18	46.86	10.39	46.82	10.59	48
49	47.93	10.19	47.88	10.40	47.84	10.61	47.79	10.81	49
50	48.91	10.40	48.86	10.61	48.81	10.82	48.77	11.03	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	78°.		77¾°.		77½°.		77¼°.		

Distance.	12°.		12¼°.		12½°.		12¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	49.89	10.60	49.84	10.82	49.79	11.04	49.74	11.26	51
52	50.86	10.81	50.82	11.03	50.77	11.25	50.72	11.48	52
53	51.84	11.02	51.79	11.25	51.74	11.47	51.69	11.70	53
54	52.82	11.23	52.77	11.46	52.72	11.69	52.67	11.92	54
55	53.80	11.44	53.75	11.67	53.70	11.90	53.64	12.14	55
56	54.78	11.64	54.72	11.88	54.67	12.12	54.62	12.36	56
57	55.75	11.85	55.70	12.09	55.65	12.34	55.59	12.58	57
58	56.73	12.06	56.68	12.31	56.63	12.55	56.57	12.80	58
59	57.71	12.27	57.66	12.52	57.60	12.77	57.55	13.02	59
60	58.69	12.47	58.63	12.73	58.58	12.99	58.52	13.24	60
61	59.67	12.68	59.61	12.94	59.55	13.20	59.50	13.46	61
62	60.65	12.89	60.59	13.16	60.53	13.42	60.47	13.68	62
63	61.62	13.10	61.57	13.37	61.51	13.64	61.45	13.90	63
64	62.60	13.31	62.54	13.58	62.48	13.85	62.42	14.12	64
65	63.58	13.51	63.52	13.79	63.46	14.07	63.40	14.35	65
66	64.56	13.72	64.50	14.00	64.44	14.29	64.37	14.57	66
67	65.54	13.93	65.47	14.22	65.41	14.50	65.35	14.79	67
68	66.51	14.14	66.45	14.43	66.39	14.72	66.32	15.01	68
69	67.49	14.35	67.43	14.64	67.36	14.93	67.30	15.23	69
70	68.47	14.55	68.41	14.85	68.34	15.15	68.27	15.45	70
71	69.45	14.76	69.38	15.06	69.32	15.37	69.25	15.67	71
72	70.43	14.97	70.36	15.28	70.29	15.58	70.22	15.89	72
73	71.40	15.18	71.34	15.49	71.27	15.80	71.20	16.11	73
74	72.38	15.39	72.32	15.70	72.25	16.02	72.18	16.33	74
75	73.36	15.59	73.29	15.91	73.22	16.23	73.15	16.55	75
76	74.34	15.80	74.27	16.13	74.20	16.45	74.13	16.77	76
77	75.32	16.01	75.25	16.34	75.17	16.67	75.10	16.99	77
78	76.30	16.22	76.22	16.55	76.15	16.88	76.08	17.21	78
79	77.27	16.43	77.20	16.76	77.13	17.10	77.05	17.44	79
80	78.25	16.63	78.18	16.97	78.10	17.32	78.03	17.66	80
81	79.23	16.84	79.16	17.19	79.08	17.53	79.00	17.88	81
82	80.21	17.05	80.13	17.40	80.06	17.75	79.98	18.10	82
83	81.19	17.26	81.11	17.61	81.03	17.96	80.95	18.32	83
84	82.16	17.46	82.09	17.82	82.01	18.18	81.93	18.54	84
85	83.14	17.67	83.06	18.04	82.99	18.40	82.90	18.76	85
86	84.12	17.88	84.04	18.25	83.96	18.61	83.88	18.98	86
87	85.10	18.09	85.02	18.46	84.94	18.83	84.85	19.20	87
88	86.08	18.30	86.00	18.67	85.91	19.05	85.83	19.42	88
89	87.06	18.50	86.97	18.88	86.89	19.26	86.81	19.64	89
90	88.03	18.71	87.95	19.10	87.87	19.48	87.78	19.86	90
91	89.01	18.92	88.93	19.31	88.84	19.70	88.76	20.08	91
92	89.99	19.13	89.91	19.52	89.82	19.91	89.73	20.30	92
93	90.97	19.34	90.88	19.73	90.80	20.13	90.71	20.52	93
94	91.95	19.54	91.86	19.94	91.77	20.35	91.68	20.75	94
95	92.92	19.75	92.84	20.16	92.75	20.56	92.66	20.97	95
96	93.90	19.96	93.81	20.37	93.72	20.78	93.63	21.19	96
97	94.88	20.17	94.79	20.58	94.70	20.99	94.61	21.41	97
98	95.86	20.38	95.77	20.79	95.68	21.21	95.58	21.63	98
99	96.84	20.58	96.75	21.01	96.65	21.43	96.56	21.85	99
100	97.81	20.79	97.72	21.22	97.63	21.64	97.53	22.07	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	78°.		77¾°.		77½°.		77¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	13°.		13¼°.		13½°.		13¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.97	0.22	0.97	0.23	0.97	0.23	0.97	0.24	1
2	1.95	0.45	1.95	0.46	1.94	0.47	1.94	0.48	2
3	2.92	0.67	2.92	0.69	2.92	0.70	2.91	0.71	3
4	3.90	0.90	3.89	0.92	3.89	0.93	3.89	0.95	4
5	4.87	1.12	4.87	1.15	4.86	1.17	4.86	1.19	5
6	5.85	1.35	5.84	1.38	5.83	1.40	5.83	1.43	6
7	6.82	1.57	6.81	1.60	6.81	1.63	6.80	1.66	7
8	7.79	1.80	7.79	1.83	7.78	1.87	7.77	1.90	8
9	8.77	2.02	8.76	2.06	8.75	2.10	8.74	2.14	9
10	9.74	2.25	9.73	2.29	9.72	2.33	9.71	2.38	10
11	10.72	2.47	10.71	2.52	10.70	2.57	10.68	2.61	11
12	11.69	2.70	11.68	2.75	11.67	2.80	11.66	2.85	12
13	12.67	2.92	12.65	2.98	12.64	3.03	12.63	3.09	13
14	13.64	3.15	13.63	3.21	13.61	3.27	13.60	3.33	14
15	14.62	3.37	14.60	3.44	14.59	3.50	14.57	3.57	15
16	15.59	3.60	15.57	3.67	15.56	3.74	15.54	3.80	16
17	16.56	3.82	16.55	3.90	16.53	3.97	16.51	4.04	17
18	17.54	4.05	17.52	4.13	17.50	4.20	17.48	4.28	18
19	18.51	4.27	18.49	4.35	18.48	4.44	18.46	4.52	19
20	19.49	4.50	19.47	4.58	19.45	4.67	19.43	4.75	20
21	20.46	4.72	20.44	4.81	20.42	4.90	20.40	4.99	21
22	21.44	4.95	21.41	5.04	21.39	5.14	21.37	5.23	22
23	22.41	5.17	22.39	5.27	22.36	5.37	22.34	5.47	23
24	23.38	5.40	23.36	5.50	23.34	5.60	23.31	5.70	24
25	24.36	5.62	24.33	5.73	24.31	5.84	24.28	5.94	25
26	25.33	5.85	25.31	5.96	25.28	6.07	25.25	6.18	26
27	26.31	6.07	26.28	6.19	26.25	6.30	26.23	6.42	27
28	27.28	6.30	27.25	6.42	27.23	6.54	27.20	6.66	28
29	28.26	6.52	28.23	6.65	28.20	6.77	28.17	6.89	29
30	29.23	6.75	29.20	6.88	29.17	7.00	29.14	7.13	30
31	30.21	6.97	30.17	7.11	30.14	7.24	30.11	7.37	31
32	31.18	7.20	31.15	7.33	31.12	7.47	31.08	7.61	32
33	32.15	7.42	32.12	7.56	32.09	7.70	32.05	7.84	33
34	33.13	7.65	33.09	7.79	33.06	7.94	33.03	8.08	34
35	34.10	7.87	34.07	8.02	34.03	8.17	34.00	8.32	35
36	35.08	8.10	35.04	8.25	35.01	8.40	34.97	8.56	36
37	36.05	8.32	36.02	8.48	35.98	8.64	35.94	8.79	37
38	37.03	8.55	36.99	8.71	36.95	8.87	36.91	9.03	38
39	38.00	8.77	37.96	8.94	37.92	9.10	37.88	9.27	39
40	38.97	9.00	38.94	9.17	38.89	9.34	38.85	9.51	40
41	39.95	9.22	39.91	9.40	39.87	9.57	39.83	9.75	41
42	40.92	9.45	40.88	9.63	40.84	9.80	40.80	9.98	42
43	41.90	9.67	41.86	9.86	41.81	10.04	41.77	10.22	43
44	42.87	9.90	42.83	10.08	42.78	10.27	42.74	10.46	44
45	43.85	10.12	43.80	10.31	43.76	10.51	43.71	10.70	45
46	44.82	10.35	44.78	10.54	44.73	10.74	44.68	10.93	46
47	45.80	10.57	45.75	10.77	45.70	10.97	45.65	11.17	47
48	46.77	10.80	46.72	11.00	46.67	11.21	46.62	11.41	48
49	47.74	11.02	47.70	11.23	47.65	11.44	47.60	11.65	49
50	48.72	11.25	48.67	11.46	48.62	11.67	48.57	11.88	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	77°.		76¾°.		76½°.		76¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	13°		13¼°		13½°		13¾°		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	49.69	11.47	49.64	11.69	49.59	11.91	49.54	12.12	51
52	50.67	11.70	50.62	11.92	50.56	12.14	50.51	12.36	52
53	51.64	11.92	51.59	12.15	51.54	12.37	51.48	12.60	53
54	52.62	12.15	52.56	12.38	52.51	12.61	52.45	12.84	54
55	53.59	12.37	53.54	12.61	53.48	12.84	53.42	13.07	55
56	54.56	12.60	54.51	12.84	54.45	13.07	54.40	13.31	56
57	55.54	12.82	55.48	13.06	55.43	13.31	55.37	13.55	57
58	56.51	13.05	56.46	13.29	56.40	13.54	56.34	13.79	58
59	57.49	13.27	57.43	13.52	57.37	13.77	57.31	14.02	59
60	58.46	13.50	58.40	13.75	58.34	14.01	58.28	14.26	60
61	59.44	13.72	59.38	13.98	59.31	14.24	59.25	14.50	61
62	60.41	13.95	60.35	14.21	60.29	14.47	60.22	14.74	62
63	61.39	14.17	61.32	14.44	61.26	14.71	61.19	14.97	63
64	62.36	14.40	62.30	14.67	62.23	14.94	62.17	15.21	64
65	63.33	14.62	63.27	14.90	63.20	15.17	63.14	15.45	65
66	64.31	14.85	64.24	15.13	64.18	15.41	64.11	15.69	66
67	65.28	15.07	65.22	15.36	65.15	15.64	65.08	15.92	67
68	66.26	15.30	66.19	15.59	66.12	15.87	66.05	16.16	68
69	67.23	15.52	67.16	15.81	67.09	16.11	67.02	16.40	69
70	68.21	15.75	68.14	16.04	68.07	16.34	67.99	16.64	70
71	69.18	15.97	69.11	16.27	69.04	16.57	68.97	16.88	71
72	70.15	16.20	70.08	16.50	70.01	16.81	69.94	17.11	72
73	71.13	16.42	71.06	16.73	70.98	17.04	70.91	17.35	73
74	72.10	16.65	72.03	16.96	71.96	17.27	71.88	17.59	74
75	73.08	16.87	73.00	17.19	72.93	17.51	72.85	17.83	75
76	74.05	17.10	73.98	17.42	73.90	17.74	73.82	18.06	76
77	75.03	17.32	74.95	17.65	74.87	17.98	74.79	18.30	77
78	76.00	17.55	75.92	17.88	75.84	18.21	75.76	18.54	78
79	76.98	17.77	76.90	18.11	76.82	18.44	76.74	18.78	79
80	77.95	18.00	77.87	18.34	77.79	18.68	77.71	19.01	80
81	78.92	18.22	78.84	18.57	78.76	18.91	78.68	19.25	81
82	79.90	18.45	79.82	18.79	79.73	19.14	79.65	19.49	82
83	80.87	18.67	80.79	19.02	80.71	19.38	80.62	19.73	83
84	81.85	18.90	81.76	19.25	81.68	19.61	81.59	19.97	84
85	82.82	19.12	82.74	19.48	82.65	19.84	82.56	20.20	85
86	83.80	19.35	83.71	19.71	83.62	20.08	83.54	20.44	86
87	84.77	19.57	84.68	19.94	84.60	20.31	84.51	20.68	87
88	85.74	19.80	85.66	20.17	85.57	20.54	85.48	20.92	88
89	86.72	20.02	86.63	20.40	86.54	20.78	86.45	21.15	89
90	87.69	20.25	87.60	20.63	87.51	21.01	87.42	21.39	90
91	88.67	20.47	88.58	20.86	88.49	21.24	88.39	21.63	91
92	89.64	20.70	89.55	21.09	89.46	21.48	89.36	21.87	92
93	90.62	20.92	90.52	21.32	90.43	21.71	90.33	22.10	93
94	91.59	21.15	91.50	21.54	91.40	21.94	91.31	22.34	94
95	92.57	21.37	92.47	21.77	92.38	22.18	92.28	22.58	95
96	93.54	21.60	93.44	22.00	93.35	22.41	93.25	22.82	96
97	94.51	21.82	94.42	22.23	94.32	22.64	94.22	23.06	97
98	95.49	22.05	95.39	22.46	95.29	22.88	95.19	23.29	98
99	96.46	22.27	96.36	22.69	96.26	23.11	96.16	23.53	99
100	97.44	22.50	97.34	22.92	97.24	23.34	97.13	23.77	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	77°		76¾°		76½°		76¼°		

TABLE 4.—TRAVERSE TABLE.

Distance.	14°.		14¼°.		14½°.		14¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.97	0.24	0.97	0.25	0.97	0.25	0.97	0.25	1
2	1.94	0.48	1.94	0.49	1.94	0.50	1.93	0.51	2
3	2.91	0.73	2.91	0.74	2.90	0.75	2.90	0.76	3
4	3.88	0.97	3.88	0.98	3.87	1.00	3.87	1.02	4
5	4.85	1.21	4.85	1.23	4.84	1.25	4.84	1.27	5
6	5.82	1.45	5.82	1.48	5.81	1.50	5.80	1.53	6
7	6.79	1.69	6.78	1.72	6.78	1.75	6.77	1.78	7
8	7.76	1.94	7.75	1.97	7.75	2.00	7.74	2.04	8
9	8.73	2.18	8.72	2.22	8.71	2.25	8.70	2.29	9
10	9.70	2.42	9.69	2.46	9.68	2.50	9.67	2.55	10
11	10.67	2.66	10.66	2.71	10.65	2.75	10.64	2.80	11
12	11.64	2.90	11.63	2.95	11.62	3.00	11.60	3.06	12
13	12.61	3.14	12.60	3.20	12.59	3.25	12.57	3.31	13
14	13.58	3.39	13.57	3.45	13.55	3.51	13.54	3.56	14
15	14.55	3.63	14.54	3.69	14.52	3.76	14.51	3.82	15
16	15.52	3.87	15.51	3.94	15.49	4.01	15.47	4.07	16
17	16.50	4.11	16.48	4.18	16.46	4.26	16.44	4.33	17
18	17.47	4.35	17.45	4.43	17.43	4.51	17.41	4.58	18
19	18.44	4.60	18.42	4.68	18.39	4.76	18.37	4.84	19
20	19.41	4.84	19.38	4.92	19.36	5.01	19.34	5.09	20
21	20.38	5.08	20.35	5.17	20.33	5.26	20.31	5.35	21
22	21.35	5.32	21.32	5.42	21.30	5.51	21.28	5.60	22
23	22.32	5.56	22.29	5.66	22.27	5.76	22.24	5.86	23
24	23.29	5.81	23.26	5.91	23.24	6.01	23.21	6.11	24
25	24.26	6.05	24.23	6.15	24.20	6.26	24.18	6.37	25
26	25.23	6.29	25.20	6.40	25.17	6.51	25.14	6.62	26
27	26.20	6.53	26.17	6.65	26.14	6.76	26.11	6.87	27
28	27.17	6.77	27.14	6.89	27.11	7.01	27.08	7.13	28
29	28.14	7.02	28.11	7.14	28.08	7.26	28.04	7.38	29
30	29.11	7.26	29.08	7.38	29.04	7.51	29.01	7.64	30
31	30.08	7.50	30.05	7.63	30.01	7.76	29.98	7.89	31
32	31.05	7.74	31.02	7.88	30.98	8.01	30.95	8.15	32
33	32.02	7.98	31.98	8.12	31.95	8.26	31.91	8.40	33
34	32.99	8.23	32.95	8.37	32.92	8.51	32.88	8.66	34
35	33.96	8.47	33.92	8.62	33.89	8.76	33.85	8.91	35
36	34.93	8.71	34.89	8.86	34.85	9.01	34.81	9.17	36
37	35.90	8.95	35.86	9.11	35.82	9.26	35.78	9.42	37
38	36.87	9.19	36.83	9.35	36.79	9.51	36.75	9.67	38
39	37.84	9.43	37.80	9.60	37.76	9.76	37.71	9.93	39
40	38.81	9.68	38.77	9.85	38.73	10.02	38.68	10.18	40
41	39 78	9.92	39.74	10.09	39.69	10.27	39.65	10.44	41
42	40.75	10.16	40.71	10.34	40.66	10.52	40.62	10.69	42
43	41.72	10.40	41.68	10.58	41.63	10.77	41.58	10.95	43
44	42.69	10.64	42.65	10.83	42.60	11.02	42.55	11.20	44
45	43.66	10.89	43.62	11.08	43.57	11.27	43.52	11.46	45
46	44.63	11.13	44.58	11.32	44.53	11.52	44.48	11.71	46
47	45.60	11.37	45.55	11.57	45.50	11.77	45.45	11.97	47
48	46.57	11.61	46.52	11.82	46.47	12.02	46.42	12.22	48
49	47.54	11.85	47.49	12.06	47.44	12.27	47.39	12.48	49
50	48.51	12.10	48.46	12.31	48.41	12.52	48.35	12.73	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	76°.		75¾°.		75½°.		75¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	14°.		14¼°.		14½°.		14¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	49.49	12.34	49.43	12.55	49.38	12.77	49.32	12.98	51
52	50.46	12.58	50.40	12.80	50.34	13.02	50.29	13.24	52
53	51.43	12.82	51.37	13.05	51.31	13.27	51.25	13.49	53
54	52.40	13.06	52.34	13.29	52.28	13.52	52.22	13.75	54
55	53.37	13.31	53.31	13.54	53.25	13.77	53.19	14.00	55
56	54.34	13.55	54.28	13.78	54.22	14.02	54.15	14.26	56
57	55.31	13.79	55.25	14.03	55.18	14.27	55.12	14.51	57
58	56.28	14.03	56.22	14.28	56.15	14.52	56.09	14.77	58
59	57.25	14.27	57.18	14.52	57.12	14.77	57.06	15.02	59
60	58.22	14.52	58.15	14.77	58.09	15.02	58.02	15.28	60
61	59.19	14.76	59.12	15.02	59.06	15.27	58.99	15.53	61
62	60.16	15.00	60.09	15.26	60.03	15.52	59.96	15.79	62
63	61.13	15.24	61.06	15.51	60.99	15.77	60.92	16.04	63
64	62.10	15.48	62.03	15.75	61.96	16.02	61.89	16.29	64
65	63.07	15.72	63.00	16.00	62.93	16.27	62.86	16.55	65
66	64.04	15.97	63.97	16.25	63.90	16.53	63.83	16.80	66
67	65.01	16.21	64.94	16.49	64.87	16.78	64.79	17.06	67
68	65.98	16.45	65.91	16.74	65.83	17.03	65.76	17.31	68
69	66.95	16.69	66.88	16.98	66.80	17.28	66.73	17.57	69
70	67.92	16.93	67.85	17.23	67.77	17.53	67.69	17.82	70
71	68.89	17.18	68.82	17.48	68.74	17.78	68.66	18.08	71
72	69.86	17.42	69.78	17.72	69.71	18.03	69.63	18.33	72
73	70.83	17.66	70.75	17.97	70.67	18.28	70.59	18.59	73
74	71.80	17.90	71.72	18.22	71.64	18.53	71.56	18.84	74
75	72.77	18.14	72.69	18.46	72.61	18.78	72.53	19.10	75
76	73.74	18.39	73.66	18.71	73.58	19.03	73.50	19.35	76
77	74.71	18.63	74.63	18.95	74.55	19.28	74.46	19.60	77
78	75.68	18.87	75.60	19.20	75.52	19.53	75.43	19.86	78
79	76.65	19.11	76.57	19.45	76.48	19.78	76.40	20.11	79
80	77.62	19.35	77.54	19.69	77.45	20.03	77.36	20.37	80
81	78.59	19.60	78.51	19.94	78.42	20.28	78.33	20.62	81
82	79.56	19.84	79.48	20.18	79.39	20.53	79.30	20.88	82
83	80.53	20.08	80.45	20.43	80.36	20.78	80.26	21.13	83
84	81.50	20.32	81.42	20.68	81.32	21.03	81.23	21.39	84
85	82.48	20.56	82.38	20.92	82.29	21.28	82.20	21.64	85
86	83.45	20.81	83.35	21.17	83.26	21.53	83.17	21.90	86
87	84.42	21.05	84.32	21.42	84.23	21.78	84.13	22.15	87
88	85.39	21.29	85.29	21.66	85.20	22.03	85.10	22.40	88
89	86.36	21.53	86.26	21.91	86.17	22.28	86.07	22.66	89
90	87.33	21.77	87.23	22.15	87.13	22 53	87.03	22.91	90
91	88.30	22.01	88.20	22.40	88.10	22.78	88.00	23.17	91
92	89.27	22.26	89.17	22.65	89.07	23.03	88.97	23.42	92
93	90.24	22.50	90.14	22.89	90.04	23.29	89.94	23.68	93
94	91.21	22.74	91.11	23.14	91.01	23.54	90.90	23.93	94
95	92.18	22.98	92.08	23.38	91.97	23.79	91.87	24.19	95
96	93.15	23.22	93.05	23.63	92.94	24.04	92.84	24.44	96
97	94.12	23.47	94.02	23.88	93.91	24.29	93.80	24.70	97
98	95.09	23.71	94.98	24.12	94.88	24.54	94.77	24.95	98
99	96.06	23.95	95.95	24.37	95.85	24.79	95.74	25.21	99
100	97.03	24.19	96.92	24.62	96.81	25.04	96.70	25.46	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	76°.		75¾°.		75½°.		75¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	15°.		15¼°.		15½°.		15¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.97	0.26	0.96	0.26	0.96	0.27	0.96	0.27	1
2	1.93	0.52	1.93	0.53	1.93	0.53	1.92	0.54	2
3	2.90	0.78	2.89	0.79	2.89	0.80	2.89	0.81	3
4	3.86	1.04	3.86	1.05	3.85	1.07	3.85	1.09	4
5	4.83	1.29	4.82	1.32	4.82	1.34	4.81	1.36	5
6	5.80	1.55	5.79	1.58	5.78	1.60	5.77	1.63	6
7	6.76	1.81	6.75	1.84	6.75	1.87	6.74	1.90	7
8	7.73	2.07	7.72	2.10	7.71	2.14	7.70	2.17	8
9	8.69	2.33	8.68	2.37	8.67	2.41	8.66	2.44	9
10	9.66	2.59	9.65	2.63	9.64	2.67	9.62	2.71	10
11	10.63	2.85	10.61	2.89	10.60	2.94	10.59	2.99	11
12	11.59	3.11	11.58	3.16	11.56	3.21	11.55	3.26	12
13	12.56	3.36	12.54	3.42	12.53	3.47	12.51	3.53	13
14	13.52	3.62	13.51	3.68	13.49	3.74	13.47	3.80	14
15	14.49	3.88	14.47	3.95	14.45	4.01	14.44	4.07	15
16	15.45	4.14	15.44	4.21	15.42	4.28	15.40	4.34	16
17	16.42	4.40	16.40	4.47	16.38	4.54	16.36	4.61	17
18	17.39	4.66	17.37	4.73	17.35	4.81	17.32	4.89	18
19	18.35	4.92	18.33	5.00	18.31	5.08	18.29	5.16	19
20	19.32	5.18	19.30	5.26	19.27	5.34	19.25	5.43	20
21	20.28	5.44	20.26	5.52	20.24	5.61	20.21	5.70	21
22	21.25	5.69	21.23	5.79	21.20	5.88	21.17	5.97	22
23	22.22	5.95	22.19	6.05	22.16	6.15	22.14	6.24	23
24	23.18	6.21	23.15	6.31	23.13	6.41	23.10	6.51	24
25	24.15	6.47	24.12	6.58	24.09	6.68	24.06	6.79	25
26	25.11	6.73	25.08	6.84	25.05	6.95	25.02	7.06	26
27	26.08	6.99	26.05	7.10	26.02	7.22	25.99	7.33	27
28	27.05	7.25	27.01	7.36	26.98	7.48	26.95	7.60	28
29	28.01	7.51	27.98	7.63	27.95	7.75	27.91	7.87	29
30	28.98	7.76	28.94	7.89	28.91	8.02	28.87	8.14	30
31	29.94	8.02	29.91	8.15	29.87	8.28	29.84	8.41	31
32	30.91	8.28	30.87	8.42	30.84	8.55	30.80	8.69	32
33	31.88	8.54	31.84	8.68	31.80	8.82	31.76	8.96	33
34	32.84	8.80	32.80	8.94	32.76	9.09	32.72	9.23	34
35	33.81	9.06	33.77	9.21	33.73	9.35	33.69	9.50	35
36	34.77	9.32	34.73	9.47	34.69	9.62	34.65	9.77	36
37	35.74	9.58	35.70	9.73	35.65	9.89	35.61	10.04	37
38	36.71	9.84	36.66	10.00	36.62	10.16	36.57	10.31	38
39	37.67	10.09	37.63	10.26	37.58	10.42	37.54	10.59	39
40	38.64	10.35	38.59	10.52	38.55	10.69	38.50	10.86	40
41	39.60	10.61	39.56	10.78	39.51	10.96	39.46	11.13	41
42	40.57	10.87	40.52	11.05	40.47	11.22	40.42	11.40	42
43	41.53	11.13	41.49	11.31	41.44	11.49	41.39	11.67	43
44	42.50	11.39	42.45	11.57	42.40	11.76	42.35	11.94	44
45	43.47	11.65	43.42	11.84	43.36	12.03	43.31	12.21	45
46	44.43	11.91	44.38	12.10	44.33	12.29	44.27	12.49	46
47	45.40	12.16	45.35	12.36	45.29	12.56	45.24	12.76	47
48	46.36	12.42	46.31	12.63	46.25	12.83	46.20	13.03	48
49	47.33	12.68	47.27	12.89	47.22	13.09	47.16	13.30	49
50	48.30	12.94	48.24	13.15	48.18	13.36	48.12	13.57	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	75°.		74¾°.		74½°.		74¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	15°.		15¼°.		15½°.		15¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	49.26	13.20	49.20	13.41	49.15	13.63	49.09	13.84	51
52	50.23	13.46	50.17	13.68	50.11	13.90	50.05	14.11	52
53	51.19	13.72	51.13	13.94	51.07	14.16	51.01	14.39	53
54	52.16	13.98	52.10	14.20	52.04	14.43	51.97	14.66	54
55	53.13	14.24	53.06	14.47	53.00	14.70	52.94	14.93	55
56	54.09	14.49	54.03	14.73	53.96	14.97	53.90	15.20	56
57	55.06	14.75	54.99	14.99	54.93	15.23	54.86	15.47	57
58	56.02	15.01	55.96	15.26	55.89	15.50	55.82	15.74	58
59	56.99	15.27	56.92	15.52	56.85	15.77	56.78	16.01	59
60	57.96	15.53	57.89	15.78	57.82	16.03	57.75	16.29	60
61	58.92	15.79	58.85	16.04	58.78	16.30	58.71	16.56	61
62	59.89	16.05	59.82	16.31	59.75	16.57	59.67	16.83	62
63	60.85	16.31	60.78	16.57	60.71	16.84	60.63	17.10	63
64	61.82	16.56	61.75	16.83	61.67	17.10	61.60	17.37	64
65	62.79	16.82	62.71	17.10	62.64	17.37	62.56	17.64	65
66	63.75	17.08	63.68	17.36	63.60	17.64	63.52	17.92	66
67	64.72	17.34	64.64	17.62	64.56	17.90	64.48	18.19	67
68	65.68	17.60	65.61	17.89	65.53	18.17	65.45	18.46	68
69	66.65	17.86	66 57	18.15	66.49	18.44	66.41	18.73	69
70	67.61	18.12	67.54	18.41	67.45	18.71	67.37	19.00	70
71	68.58	18.38	68.50	18.68	68.42	18.97	68.33	19.27	71
72	69.55	18.63	69.46	18.94	69.38	19.24	69.30	19.54	72
73	70.51	18.89	70.43	19.20	70.35	19.51	70.26	19.82	73
74	71.48	19.15	71.39	19.46	71.31	19.78	71.22	20.09	74
75	72.44	19.41	72.36	19.73	72.27	20.04	72.18	20.36	75
76	73.41	19.67	73.32	19.99	73.24	20.31	73.15	20.63	76
77	74.38	19.93	74.29	20.25	74.20	20.58	74.11	20.90	77
78	75.34	20.19	75.25	20.52	75.16	20.84	75.07	21.17	78
79	76.31	20.45	76.22	20.78	76.13	21.11	76.03	21.44	79
80	77.27	20.71	77.18	21.04	77.09	21.38	77.00	21.72	80
81	78.24	20.96	78.15	21.31	78.05	21.65	77.96	21.99	81
82	79.21	21.22	79.11	21.57	79.02	21.91	78.92	22.26	82
83	80.17	21.48	80.08	21.83	79.98	22.18	79.88	22.53	83
84	81.14	21.74	81.04	22.09	80.94	22.45	80.85	22.80	84
85	82.10	22.00	82.01	22.36	81.91	22.72	81.81	23.07	85
86	83.07	22.26	82.97	22.62	82.87	22.98	82.77	23.34	86
87	84.04	22.52	83.94	22.88	83.84	23.25	83.73	23.62	87
88	85.00	22.78	84.90	23.15	84.80	23.52	84.70	23.89	88
89	85.97	23.03	85.87	23.41	85.76	23.78	85.66	24.16	89
90	86.93	23.29	86.83	23.67	86.73	24.05	86.62	24.43	90
91	87.90	23.55	87.80	23.94	87.69	24.32	87.58	24.70	91
92	88.87	23.81	88.76	24.20	88.65	24.59	88.55	24.97	92
93	89.83	24.07	89.73	24.46	89.62	24.85	89.51	25.24	93
94	90.80	24.33	90.69	24.72	90.58	25.12	90.47	25.52	94
95	91.76	24.59	91.65	24.99	91.54	25.39	91.43	25.79	95
96	92.73	24.85	92.62	25.25	92.51	25.65	92.40	26.06	96
97	93.69	25.11	93.58	25.51	93.47	25.92	93.36	26.33	97
98	94.66	25.36	94.55	25.78	94.44	26.19	94.32	26.60	98
99	95.63	25.62	95.51	26.04	95.40	26.46	95.28	26.87	99
100	96.59	25.88	96.48	26.30	96.36	26.72	96.25	27.14	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	75°.		74¾°.		74½°.		74¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	16°.		16¼°.		16½°.		16¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.96	0.28	0.96	0.28	0.96	0.28	0.96	0.29	1
2	1.92	0.55	1.92	0.56	1.92	0.57	1.92	0.58	2
3	2.88	0.83	2.88	0.84	2.88	0.85	2.87	0.86	3
4	3.85	1.10	3.84	1.12	3.84	1.14	3.83	1.15	4
5	4.81	1.38	4.80	1.40	4.79	1.42	4.79	1.44	5
6	5.77	1.65	5.76	1.68	5.75	1.70	5.75	1.73	6
7	6.73	1.93	6.72	1.96	6.71	1.99	6.70	2.02	7
8	7.69	2.21	7.68	2.24	7.67	2.27	7.66	2.31	8
9	8.65	2.48	8.64	2.52	8.63	2.56	8.62	2.59	9
10	9.61	2.76	9.60	2.80	9.59	2.84	9.58	2.88	10
11	10.57	3.03	10.56	3.08	10.55	3.12	10.53	3.17	11
12	11.54	3.31	11.52	3.36	11.51	3.41	11.49	3.46	12
13	12.50	3.58	12.48	3.64	12.46	3.69	12.45	3.75	13
14	13.46	3.86	13.44	3.92	13.42	3.98	13.41	4.03	14
15	14.42	4.13	14.40	4.20	14.38	4.26	14.36	4.32	15
16	15.38	4.41	15.36	4.48	15.34	4.54	15.32	4.61	16
17	16.34	4.69	16.32	4.76	16.30	4.83	16.28	4.90	17
18	17.30	4.96	17.28	5.04	17.26	5.11	17.24	5.19	18
19	18.26	5.24	18.24	5.32	18.22	5.40	18.19	5.48	19
20	19.23	5.51	19.20	5.60	19.18	5.68	19.15	5.76	20
21	20.19	5.79	20.16	5.88	20.14	5.96	20.11	6.05	21
22	21.15	6.06	21.12	6.16	21.09	6.25	21.07	6.34	22
23	22.11	6.34	22.08	6.44	22.05	6.53	22.02	6.63	23
24	23.07	6.62	23.04	6.72	23.01	6.82	22.98	6.92	24
25	24.03	6.89	24.00	7.00	23.97	7.10	23.94	7.20	25
26	24.99	7.17	24.96	7.28	24.93	7.38	24.90	7.49	26
27	25.95	7.44	25.92	7.56	25.89	7.67	25.85	7.78	27
28	26.92	7.72	26.88	7.84	26.85	7.95	26.81	8.07	28
29	27.88	7.99	27.84	8.12	27.81	8.24	27.77	8.36	29
30	28.84	8.27	28.80	8.39	28.76	8.52	28.73	8.65	30
31	29.80	8.54	29.76	8.67	29.72	8.80	29.68	8.93	31
32	30.76	8.82	30.72	8.95	30.68	9.09	30.64	9.22	32
33	31.72	9.10	31.68	9.23	31.64	9.37	31.60	9.51	33
34	32.68	9.37	32.64	9.51	32.60	9.66	32.56	9.80	34
35	33.64	9.65	33.60	9.79	33.56	9.94	33.51	10.09	35
36	34.61	9.92	34.56	10.07	34.52	10.22	34.47	10.38	36
37	35.57	10.20	35.52	10.35	35.48	10.51	35.43	10.66	37
38	36.53	10.47	36.48	10.63	36.44	10.79	36.39	10.95	38
39	37.49	10.75	37.44	10.91	37.39	11.08	37.35	11.24	39
40	38.45	11.03	38.40	11.19	38.35	11.36	38.30	11.53	40
41	39.41	11.30	39.36	11.47	39.31	11.64	39.26	11.82	41
42	40.37	11.58	40.32	11.75	40.27	11.93	40.22	12.10	42
43	41.33	11.85	41.28	12.03	41.23	12.21	41.18	12.39	43
44	42.30	12.13	42.24	12.31	42.19	12.50	42.13	12.68	44
45	43.26	12.40	43.20	12.59	43.15	12.78	43.09	12.97	45
46	44.22	12.68	44.16	12.87	44.11	13.06	44.05	13.26	46
47	45.18	12.95	45.12	13.15	45.06	13.35	45.01	13.55	47
48	46.14	13.23	46.08	13.43	46.02	13.63	45.96	13.83	48
49	47.10	13.51	47.04	13.71	46.98	13.92	46.92	14.12	49
50	48.06	13.78	48.00	13.99	47.94	14.20	47.88	14.41	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	74°.		73¾°.		73½°.		73¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	16°.		16¼°.		16½°.		16¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	49.02	14.06	48.96	14.27	48.90	14.48	48.84	14.70	51
52	49.99	14.33	49.92	14.55	49.86	14.77	49.79	14.99	52
53	50.95	14.61	50.88	14.83	50.82	15.05	50.75	15.27	53
54	51.91	14.88	51.84	15.11	51.78	15.34	51.71	15.56	54
55	52.87	15.16	52.80	15.39	52.74	15.62	52.67	15.85	55
56	53.83	15.44	53.76	15.67	53.69	15.90	53.62	16.14	56
57	54.79	15.71	54.72	15.95	54.65	16.19	54.58	16.43	57
58	55.75	15.99	55.68	16.23	55.61	16.47	55.54	16.72	58
59	56.71	16.26	56.64	16.51	56.57	16.76	56.50	17.00	59
60	57.68	16.54	57.60	16.79	57.53	17.04	57.45	17.29	60
61	58.64	16.81	58.56	17.07	58.49	17.32	58.41	17.58	61
62	59.60	17.09	59.52	17.35	59.45	17.61	59.37	17.87	62
63	60.56	17.37	60.48	17.63	60.41	17.89	60.33	18.16	63
64	61.52	17.64	61.44	17.91	61.36	18.18	61.28	18.44	64
65	62.48	17.92	62.40	18.19	62.32	18.46	62.24	18.73	65
66	63.44	18.19	63.36	18.47	63.28	18.75	63 20	19.02	66
67	64.40	18.47	64.32	18.75	64.24	19.03	64.16	19.31	67
68	65.37	18.74	65.28	19.03	65.20	19.31	65.11	19.60	68
69	66.33	19.02	66.24	19.31	66.16	19.60	66.07	19.89	69
70	67.29	19.29	67.20	19.59	67.12	19.88	67.03	20.17	70
71	68.25	19.57	68.16	19.87	68.08	20.17	67.99	20.46	71
72	69.21	19.85	69 12	20.15	69.04	20.45	68.95	20.75	72
73	70.17	20.12	70.08	20.43	69.99	20.73	69.90	21.04	73
74	71.13	20.40	71.04	20.71	70.95	21.02	70.86	21.33	74
75	72.09	20.67	72.00	20.99	71.91	21.30	71.82	21.61	75
76	73.06	20.95	72.96	21.27	72.87	21.59	72.78	21.90	76
77	74.02	21.22	73.92	21.55	73.83	21.87	73.73	22.19	77
78	74.98	21.50	74.88	21.83	74.79	22.15	74.69	22.48	78
79	75.94	21.78	75.84	22.11	75.75	22.44	75.65	22.77	79
80	76.90	22.05	76.80	22.39	76.71	22.72	76.61	23.06	80
81	77.86	22.33	77.76	22.67	77.66	23.01	77.56	23.34	81
82	78.82	22.60	78.72	22.95	78.62	23.29	78.52	23.63	82
83	79.78	22.88	79.68	23.23	79.58	23.57	79.48	23.92	83
84	80.75	23.15	80.64	23.51	80.54	23.86	80.44	24.21	84
85	81.71	23.43	81.60	23.79	81.50	24.14	81.39	24.50	85
86	82.67	23.70	82.56	24.07	82.46	24.43	82.35	24.78	86
87	83.63	23.98	83.52	24.35	83.42	24.71	83.31	25.07	87
88	84.59	24.26	84.48	24.62	84.38	24.99	84.27	25.36	88
89	85.55	24.53	85.44	24.90	85.33	25.28	85.22	25.65	89
90	86.51	24.81	86.40	25.18	86.29	25.56	86.18	25.94	90
91	87.47	25.08	87.36	25.46	87.25	25.85	87.14	26.23	91
92	88.44	25.36	88.32	25.74	88.21	26.13	88.10	26.51	92
93	89.40	25.63	89.28	26.02	89.17	26.41	89.05	26.80	93
94	90.36	25.91	90.24	26.30	90.13	26.70	90.01	27.09	94
95	91.32	26.19	91.20	26.58	91.09	26.98	90.97	27.38	95
96	92.28	26.46	92.16	26.86	92.05	27.27	91.93	27.67	96
97	93.24	26.74	93.12	27.14	93.01	27.55	92.88	27.96	97
98	94.20	27.01	94.08	27.42	93.96	27.83	93.84	28.24	98
99	95.16	27.29	95.04	27.70	94.92	28.12	94.80	28.53	99
100	96.13	27.56	96.00	27.98	95.88	28.40	95.76	28.82	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	74°.		73¾°.		73½°.		73¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	17°.		17¼°.		17½°.		17¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	**0.96**	**0.29**	0.96	0.30	0.95	0.30	0.95	0.30	1
2	1.91	0.58	1.91	0.59	1.91	0.60	1.90	0.61	2
3	2.87	0.88	2.87	0.89	2.86	0.90	2.86	0.91	3
4	3.83	1.17	3.82	1.19	3.81	1.20	3.81	1.22	4
5	4.78	1.46	4.78	1.48	4.77	1.50	4.76	1.52	5
6	5.74	1.75	5.73	1.78	5.72	1.80	5.71	1.83	6
7	6.69	2.05	6.69	2.08	6.68	2.10	6.67	2.13	7
8	7.65	2.34	7.64	2.37	7.63	2.41	7.62	2.44	8
9	8.61	2.63	8.60	2.67	8.58	2.71	8.57	2.74	9
10	9.56	2.92	9.55	2.97	9.54	3.01	9.52	3.05	10
11	10.52	3.22	10.51	3.26	10.49	3.31	10.48	3.35	11
12	11.48	3.51	11.46	3.56	11.44	3.61	11.43	3.66	12
13	12.43	3.80	12.42	3.86	12.40	3.91	12.38	3.96	13
14	13.39	4.09	13.37	4.15	13.35	4.21	13.33	4.27	14
15	14.34	4.39	14.33	4.45	14.31	4.51	14.29	4.57	15
16	15.30	4.68	15.28	4.74	15.26	4.81	15.24	4.88	16
17	16.26	4.97	16.24	5.04	16.21	5.11	16.19	5.18	17
18	17.21	5.26	17.19	5.34	17.17	5.41	17.14	5.49	18
19	18.17	5.56	18.15	5.63	18.12	5.71	18.10	5.79	19
20	19.13	5.85	19.10	5.93	19.07	6.01	19.05	6.10	20
21	20.08	6.14	20.06	6.23	20.03	6.31	20.00	6.40	21
22	21.04	6.43	21.01	6.52	20.98	6.62	20.95	6.71	22
23	22.00	6.72	21.97	6.82	21.94	6.92	21.91	7.01	23
24	22.95	7.02	22.92	7.12	22.89	7.22	22.86	7.32	24
25	23.91	7.31	23.88	7.41	23.84	7.52	23.81	7.62	25
26	24.86	7.60	24.83	7.71	24.80	7.82	24.76	7.93	26
27	25.82	7.89	25.79	8.01	25.75	8.12	25.71	8.23	27
28	26.78	8.19	26.74	8.30	26.70	8.42	26.67	8.54	28
29	27.73	8.48	27.70	8.60	27.66	8.72	27.62	8.84	29
30	28.69	8.77	28.65	8.90	28.61	9.02	28.57	9.15	30
31	29.65	9.06	29.61	9.19	29.57	9.32	29.52	9.45	31
32	30.60	9.36	30.56	9.49	30.52	9.62	30.48	9.76	32
33	31.56	9.65	31.52	9.79	31.47	9.92	31.43	10.06	33
34	32.51	9.94	32.47	10.08	32.43	10.22	32.38	10.37	34
35	33.47	10.23	33.43	10.38	33.38	10.52	33.33	10.67	35
36	34.43	10.53	34.38	10.68	34.33	10.83	34.29	10.98	36
37	35.38	10.82	35.34	10.97	35.29	11.13	35.24	11.28	37
38	36.34	11.11	36.29	11.27	36.24	11.43	36.19	11.58	38
39	37.30	11.40	37.25	11.57	37.19	11.73	37.14	11.89	39
40	38.25	11.69	38.20	11.86	38.15	12.03	38.10	12.19	40
41	39.21	11.99	39.16	12.16	39.10	12.33	39.05	12.50	41
42	40.16	12.28	40.11	12.45	40.06	12.63	40.00	12.80	42
43	41.12	12.57	41.07	12.75	41.01	12.93	40.95	13.11	43
44	42.08	12.86	42.02	13.05	41.96	13.23	41.91	13.41	44
45	43.03	13.16	42.98	13.34	42.92	13.53	42.86	13.72	45
46	43.99	13.45	43.93	13.64	43.87	13.83	43.81	14.02	46
47	44.95	13.74	44.89	13.94	44.82	14.13	44.76	14.33	47
48	45.90	14.03	45.84	14.23	45.78	14.43	45.71	14.63	48
49	46.86	14.33	46.80	14.53	46.73	14.73	46.67	14.94	49
50	47.82	14.62	47.75	14.83	47.69	15.04	47.62	15.24	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	73°.		72¾°.		72½°.		72¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	17°.		17¼°.		17½°.		17¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	48.77	14.91	48.71	15.12	48.64	15.34	48.57	15.55	51
52	49.73	15.20	49.66	15.42	49.59	15.64	49.52	15.85	52
53	50.68	15.50	50.62	15.72	50.55	15.94	50.48	16.16	53
54	51.64	15.79	51.57	16.01	51.50	16.24	51.43	16.46	54
55	52.60	16.08	52.53	16.31	52.45	16.54	52.38	16.77	55
56	53.55	16.37	53.48	16.61	53.41	16.84	53.33	17.07	56
57	54.51	16.67	54.44	16.90	54.36	17.14	54.29	17.38	57
58	55.47	16.96	55.39	17.20	55.32	17.44	55.24	17.68	58
59	56.42	17.25	56.35	17.50	56.27	17.74	56.19	17.99	59
60	57.38	17.54	57.30	17.79	57.22	18.04	57.14	18.29	60
61	58.33	17.83	58.26	18.09	58.18	18.34	58.10	18.60	61
62	59.29	18.13	59.21	18.39	59.13	18.64	59.05	18.90	62
63	60.25	18.42	60.17	18.68	60.08	18.94	60.00	19.21	63
64	61.20	18.71	61.12	18.98	61.04	19.25	60.95	19.51	64
65	62.16	19.00	62.08	19.28	61.99	19.55	61.91	19.82	65
66	63.12	19.30	63.03	19.57	62.95	19.85	62.86	20.12	66
67	64.07	19.59	63.99	19.87	63.90	20.15	63.81	20.43	67
68	65.03	19.88	64.94	20.16	64.85	20.45	64.76	20.73	68
69	65.99	20.17	65.90	20.46	65.81	20.75	65.72	21.04	69
70	66.94	20.47	66.85	20.76	66.76	21.05	66.67	21.34	70
71	67.90	20.76	67.81	21.05	67.71	21.35	67.62	21.65	71
72	68.85	21.05	68.76	21.35	68.67	21.65	68.57	21.95	72
73	69.81	21.34	69.72	21.65	69.62	21.95	69.52	22.26	73
74	70.77	21.64	70.67	21.94	70.58	22.25	70.48	22.56	74
75	71.72	21.93	71.63	22.24	71.53	22.55	71.43	22.86	75
76	72.68	22.22	72.58	22.54	72.48	22.85	72.38	23.17	76
77	73.64	22.51	73.54	22.83	73.44	23.15	73.33	23.47	77
78	74.59	22.80	74.49	23.13	74.39	23.46	74.29	23.78	78
79	75.55	23.10	75.45	23.43	75.34	23.76	75.24	24.08	79
80	76.50	23.39	76.40	23.72	76.30	24.06	76.19	24.39	80
81	77.46	23.68	77.36	24.02	77.25	24.36	77.14	24.69	81
82	78.42	23.97	78.31	24.32	78.20	24.66	78.10	25.00	82
83	79.37	24.27	79.27	24.61	79.16	24.96	79.05	25.30	83
84	80.33	24.56	80.22	24.91	80.11	25.26	80.00	25.61	84
85	81.29	24.85	81.18	25.21	81.07	25.56	80.95	25.91	85
86	82.24	25.14	82.13	25.50	82.02	25.86	81.91	26.22	86
87	83.20	25.44	83.09	25.80	82.97	26.16	82.86	26.52	87
88	84.15	25.73	84.04	26.10	83.93	26.46	83.81	26.83	88
89	85.11	26.02	85.00	26.39	84.88	26.76	84.76	27.13	89
90	86.07	26.31	85.95	26.69	85.83	27.06	85.72	27.44	90
91	87.02	26.61	86.91	26.99	86.79	27.36	86.67	27.74	91
92	87.98	26.90	87.86	27.28	87.74	27.66	87.62	28.05	92
93	88.94	27.19	88.82	27.58	88.70	27.97	88.57	28.35	93
94	89.89	27.48	89.77	27.87	89.65	28.27	89.53	28.66	94
95	90.85	27.78	90.73	28.17	90.60	28.57	90.48	28.96	95
96	91.81	28.07	91.68	28.47	91.56	28.87	91.43	29.27	96
97	92.76	28.36	92.64	28.76	92.51	29.17	92.38	29.57	97
98	93.72	28.65	93.59	29.06	93.46	29.47	93.33	29.88	98
99	94.67	28.94	94.55	29.36	94.42	29.77	94.29	30.18	99
100	95.63	29.24	95.50	29.65	95.37	30.07	95.24	30.49	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	73°.		72¾°.		72½°.		72¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	18°.		18¼°.		18½°.		18¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.95	0.31	0.95	0.31	0.95	0.32	0.95	0.32	1
2	1.90	0.62	1.90	0.63	1.90	0.63	1.89	0.64	2
3	2.85	0.93	2.85	0.94	2.84	0.95	2.84	0.96	3
4	3.80	1.24	3.80	1.25	3.79	1.27	3.79	1.29	4
5	4.76	1.55	4.75	1.57	4.74	1 59	4.73	1.61	5
6	5.71	1.85	5.70	1.88	5.69	1.90	5.68	1.93	6
7	6.66	2.16	6.65	2.19	6.64	2.22	6.63	2.25	7
8	7.61	2.47	7.60	2.51	7.59	2.54	7.58	2.57	8
9	8.56	2.78	8.55	2.82	8.53	2.86	8.52	2.89	9
10	9.51	3.09	9.50	3.13	9.48	3.17	9.47	3.21	10
11	10.46	3.40	10.45	3.44	10.43	3.49	10.42	3.54	11
12	11.41	3.71	11.40	3.76	11.38	3.81	11.36	3.86	12
13	12.36	4.02	12.35	4.07	12.33	4.12	12.31	4.18	13
14	13.31	4.33	13.30	4.38	13.28	4.44	13.26	4.50	14
15	14.27	4.64	14.25	4.70	14.22	4.76	14.20	4.82	15
16	15.22	4.94	15.20	5.01	15.17.	5.08	15.15	5.14	16
17	16.17	5.25	16.14	5.32	16.12	5.39	16.10	5.46	17
18	17.12	5.56	17.09	5.64	17.07	5.71	17.04	5.79	18
19	18.07	5.87	18.04	5.95	18.02	6.03	17.99	6.11	19
20	19.02	6.18	18.99	6.26	18.97	6.35	18.94	6.43	20
21	19.97	6.49	19.94	6.58	19.91	6.66	19.89	6.75	21
22	20.92	6.80	20.89	6.89	20.86	6.98	20.83	7.07	22
23	21.87	7.11	21.84	7.20	21.81	7.30	21.78	7.39	23
24	22.83	7.42	22.79	7.52	22.76	7.62	22.73	7.71	24
25	23.78	7.73	23.74	7.83	23.71	7.93	23.67	8.04	25
26	24.73	8.03	24.69	8.14	24.66	8.25	24.62	8.36	26
27	25.68	8.34	25.64	8.46	25.60	8.57	25.57	8.68	27
28	26.63	8.65	26.59	8.77	26.55	8.88	26.51	9.00	28
29	27.58	8.96	27.54	9.08	27.50	9.20	27.46	9.32	29
30	28.53	9.27	28.49	9.39	28.45	9.52	28.41	9.64	30
31	29.48	9.58	29.44	9.71	29.40	9.84	29.35	9.96	31
32	30.43	9.89	30.39	10.02	30.35	10.15	30.30	10.29	32
33	31.38	10.20	31.34	10.33	31.29	10.47	31.25	10.61	33
34	32.34	10.51	32.29	10.65	32.24	10.79	32.20	10.93	34
35	33.29	10.82	33.24	10.96	33.19	11.11	33.14	11.25	35
36	34.24	11.12	34.19	11.27	34.14	11.42	34.09	11.57	36
37	35.19	11.43	35.14	11.59	35.09	11.74	35.04	11.89	37
38	36.14	11.74	36.09	11.90	36.04	12.06	35.98	12.21	38
39	37.09	12.05	37.04	12.21	36.98	12.37	36.93	12.54	39
40	38.04	12.36	37.99	12.53	37.93	12.69	37.88	12.86	40
41	38.99	12.67	38.94	12.84	38.88	13.01	38.82	13.18	41
42	39.94	12.98	39.89	13.15	39.83	13.33	39.77	13.50	42
43	40.90	13.29	40.84	13.47	40.78	13.64	40.72	13.82	43
44	41.85	13.60	41.79	13.78	41.73	13.96	41.66	14.14	44
45	42.80	13.91	42.74	14.09	42.67	14.28	42.61	14.46	45
46	43.75	14.21	43.69	14.41	43.62	14.60	43.56	14.79	46
47	44.70	14.52	44.64	14.72	44.57	14.91	44.51	15.11	47
48	45.65	14.83	45.59	15.03	45.52	15.23	45.45	15.43	48
49	46.60	15.14	46.54	15.35	46.47	15.55	46.40	15.75	49
50	47.55	15.45	47.48	15.66	47.42	15.87	47.35	16.07	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	72°.		71¾°.		71½°.		71¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	18°.		18¼°.		18½°.		18¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	48.50	15.76	48.43	15.97	48.36	16.18	48.29	16.39	51
52	49.45	16.07	49.38	16.28	49.31	16.50	49.24	16.71	52
53	50.41	16.38	50.33	16.60	50.26	16.82	50.19	17.04	53
54	51.36	16.69	51.28	16.91	51.21	17.13	51.13	17.36	54
55	52.31	17.00	52.23	17.22	52.16	17.45	52.08	17.68	55
56	53.26	17.30	53.18	17.54	53.11	17.77	53.03	18.00	56
57	54.21	17.61	54.13	17.85	54.05	18.09	53.98	18.32	57
58	55.16	17.92	55.08	18.16	55.00	18.40	54.92	18.64	58
59	56.11	18.23	56.03	18.48	55.95	18.72	55.87	18.96	59
60	57.06	18.54	56.98	18.79	56.90	19.04	56.82	19.29	60
61	58.01	18.85	57.93	19.10	57.85	19.36	57.76	19.61	61
62	58.97	19.16	58.88	19.42	58.80	19.67	58.71	19.93	62
63	59.92	19.47	59.83	19.73	59.74	19.99	59.66	20.25	63
64	60.87	19.78	60.78	20.04	60.69	20.31	60.60	20.57	64
65	61.82	20.09	61.73	20.36	61.64	20.62	61.55	20.89	65
66	62.77	20.40	62.68	20.67	62.59	20.94	62.50	21.22	66
67	63.72	20.70	63.63	20.98	63.54	21.26	63.44	21.54	67
68	64.67	21.01	64.58	21.30	64.49	21.58	64.39	21.86	68
69	65.62	21.32	65.53	21.61	65.43	21.89	65.34	22.18	69
70	66.57	21.63	66.48	21.92	66.38	22.21	66.29	22.50	70
71	67.53	21.94	67.43	22.23	67.33	22.53	67.23	22.82	71
72	68.48	22.25	68.38	22.55	68.28	22.85	68.18	23.14	72
73	69.43	22.56	69.33	22.86	69.23	23.16	69.13	23.47	73
74	70.38	22.87	70.28	23.17	70.18	23.48	70.07	23.79	74
75	71.33	23.18	71.23	23.49	71.12	23.80	71.02	24.11	75
76	72.28	23.49	72.18	23.80	72.07	24.12	71.97	24.43	76
77	73.23	23.79	73.13	24.11	73.02	24.43	72.91	24.75	77
78	74.18	24.10	74.08	24.43	73.97	24.75	73.86	25.07	78
79	75.13	24.41	75.03	24.74	74.92	25.07	74.81	25.39	79
80	76.08	24.72	75.98	25.05	75.87	25.38	75.75	25.72	80
81	77.04	25.03	76.93	25.37	76.81	25.70	76.70	26.04	81
82	77.99	25.34	77.88	25.68	77.76	26.02	77.65	26.36	82
83	78.94	25.65	78.83	25.99	78.71	26.34	78.60	26.68	83
84	79.89	25.96	79.77	26.31	79.66	26.65	79.54	27.00	84
85	80.84	26.27	80.72	26.62	80.61	26.97	80.49	27.32	85
86	81.79	26.58	81.67	26.93	81.56	27.29	81.44	27.64	86
87	82.74	26.88	82.62	27.25	82.50	27.61	82.38	27.97	87
88	83.69	27.19	83.57	27.56	83.45	27.92	83.33	28.29	88
89	84.64	27.50	84.52	27.87	84.40	28.24	84.28	28.61	89
90	85.60	27.81	85.47	28.18	85.35	28.56	85.22	28.93	90
91	86.55	28.12	86.42	28.50	86.30	28.87	86.17	29.25	91
92	87.50	28.43	87.37	28.81	87.25	29.19	87.12	29.57	92
93	88.45	28.74	88.32	29.12	88.19	29.51	88.06	29.89	93
94	89.40	29.05	89.27	29.44	89.14	29.83	89.01	30.22	94
95	90.35	29.36	90.22	29.75	90.09	30.14	89.96	30.54	95
96	91.30	29.67	91.17	30.06	91.04	30.46	90.91	30.86	96
97	92.25	29.97	92.12	30.38	91.99	30.78	91.85	31.18	97
98	93.20	30.28	93.07	30.69	92.94	31.10	92.80	31.50	98
99	94.15	30.59	94.02	31.00	93.88	31.41	93.75	31.82	99
100	95.11	30.90	94.97	31.32	94.83	31.73	94.69	32.14	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	72°.		71¾°.		71½°.		71¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	19°.		19¼°.		19½°.		19¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.95	0.33	0.94	0.33	0.94	0.33	0.94	0.34	1
2	1.89	0.65	1.89	0.66	1.89	0.67	1.88	0.68	2
3	2.84	0.98	2.83	0.99	2.83	1.00	2.82	1.01	3
4	3.78	1.30	3.78	1.32	3.77	1.34	3.76	1.35	4
5	4.73	1.63	4.72	1.65	4.71	1.67	4.71	1.69	5
6	5.67	1.95	5.66	1.98	5.66	2.00	5.65	2.03	6
7	6.62	2.28	6.61	2.31	6.60	2.34	6.59	2.37	7
8	7.56	2.60	7.55	2.64	7.54	2.67	7.53	2.70	8
9	8.51	2.93	8.50	2.97	8.48	3.00	8.47	3.04	9
10	9.46	3.26	9.44	3.30	9.43	3.34	9.41	3.38	10
11	10.40	3.58	10.38	3.63	10.37	3.67	10.35	3.72	11
12	11.35	3.91	11.33	3.96	11.31	4.01	11.29	4.06	12
13	12.29	4.23	12.27	4.29	12.25	4.34	12.24	4.39	13
14	13.24	4.56	13.22	4.62	13.20	4.67	13.18	4.73	14
15	14.18	4.88	14.16	4.95	14.14	5.01	14.12	5.07	15
16	15.13	5.21	15.11	5.28	15.08	5.34	15.06	5.41	16
17	16.07	5.53	16.05	5.60	16.02	5.67	16.00	5.74	17
18	17.02	5.86	16.99	5.93	16.97	6.01	16.94	6.08	18
19	17.96	6.19	17.94	6.26	17.91	6.34	17.88	6.42	19
20	18.91	6.51	18.88	6.59	18.85	6.68	18.82	6.76	20
21	19.86	6.84	19.83	6.92	19.80	7.01	19.76	7.10	21
22	20.80	7.16	20.77	7.25	20.74	7.34	20.71	7.43	22
23	21.75	7.49	21.71	7.58	21.68	7.68	21.65	7.77	23
24	22.69	7.81	22.66	7.91	22.62	8.01	22.59	8.11	24
25	23.64	8.14	23.60	8.24	23.57	8.35	23.53	8.45	25
26	24.58	8.46	24.55	8.57	24.51	8.68	24.47	8.79	26
27	25.53	8.79	25.49	8.90	25.45	9.01	25.41	9.12	27
28	26.47	9.12	26.43	9.23	26.39	9.35	26.35	9.46	28
29	27.42	9.44	27.38	9.56	27.34	9.68	27.29	9.80	29
30	28.37	9.77	28.32	9.89	28.28	10.01	28.24	10.14	30
31	29.31	10.09	29.27	10.22	29.22	10.35	29.18	10.48	31
32	30.26	10.42	30.21	10.55	30.16	10.68	30.12	10.81	32
33	31.20	10.74	31.15	10.88	31.11	11.02	31.06	11.15	33
34	32.15	11.07	32.10	11.21	32.05	11.35	32.00	11.49	34
35	33.09	11.39	33.04	11.54	32.99	11.68	32.94	11.83	35
36	34.04	11.72	33.99	11.87	33.94	12.02	33.88	12.17	36
37	34.98	12.05	34.93	12.20	34.88	12.35	34.82	12.50	37
38	35.93	12.37	35.88	12.53	35.82	12.68	35.76	12.84	38
39	36.88	12.70	36.82	12.86	36.76	13.02	36.71	13.18	39
40	37.82	13.02	37.76	13.19	37.71	13.35	37.65	13.52	40
41	38.77	13.35	38.71	13.52	38.65	13.69	38.59	13.85	41
42	39.71	13.67	39.65	13.85	39.59	14.02	39.53	14.19	42
43	40.66	14.00	40.60	14.18	40.53	14.35	40.47	14.53	43
44	41.60	14.33	41.54	14.51	41.48	14.69	41.41	14.87	44
45	42.55	14.65	42.48	14.84	42.42	15.02	42.35	15.21	45
46	43.49	14.98	43.43	15.17	43.36	15.36	43.29	15.54	46
47	44.44	15.30	44.37	15.50	44.30	15.69	44.24	15.88	47
48	45.38	15.63	45.32	15.83	45.25	16.02	45.18	16.22	48
49	46.33	15.95	46.26	16.15	46.19	16.36	46.12	16.56	49
50	47.28	16.28	47.20	16.48	47.13	16.69	47.06	16.90	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	71°.		70¾°.		70½°.		70¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	19°.		19¼°.		19½°.		19¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	48.22	16.60	48.15	16.81	48.07	17.02	48.00	17.23	51
52	49.17	16.93	49.09	17.14	49.02	17.36	48.94	17.57	52
53	50.11	17.26	50.04	17.47	49.96	17.69	49.88	17.91	53
54	51.06	17.58	50.98	17.80	50.90	18.03	50.82	18.25	54
55	52.00	17.91	51.92	18.13	51.85	18.36	51.76	18.59	55
56	52.95	18.23	52.87	18.46	52.79	18.69	52.71	18.92	56
57	53.89	18.56	53.81	18.79	53.73	19.03	53.65	19.26	57
58	54.84	18.88	54.76	19.12	54.67	19.36	54.59	19.60	58
59	55.79	19.21	55.70	19.45	55.62	19.69	55.53	19.94	59
60	56.73	19.53	56.65	19.78	56.56	20.03	56.47	20.28	60
61	57.68	19.86	57.59	20.11	57.50	20.36	57.41	20.61	61
62	58.62	20.19	58.53	20.44	58.44	20.70	58.35	20.95	62
63	59.57	20.51	59.48	20.77	59.39	21.03	59.29	21.29	63
64	60.51	20.84	60.42	21.10	60.33	21.36	60.24	21.63	64
65	61.46	21.16	61.37	21.43	61.27	21.70	61.18	21.96	65
66	62.40	21.49	62.31	21.76	62.21	22.03	62.12	22.30	66
67	63.35	21.81	63.25	22.09	63.16	22.37	63.06	22.64	67
68	64.30	22.14	64.20	22.42	64.10	22.70	64.00	22.98	68
69	65.24	22.46	65.14	22.75	65.04	23.03	64.94	23.32	69
70	66.19	22.79	66.09	23.08	65.98	23.37	65.88	23.65	70
71	67.13	23.12	67.03	23.41	66.93	23.70	66.82	23.99	71
72	68.08	23.44	67.97	23.74	67.87	24.03	67.76	24.33	72
73	69.02	23.77	68.92	24.07	68.81	24.37	68.71	24.67	73
74	69.97	24.09	69.86	24.40	69.76	24.70	69.65	25.01	74
75	70.91	24.42	70.81	24.73	70.70	25.04	70.59	25.34	75
76	71.86	24.74	71.75	25.06	71.64	25.37	71.53	25.68	76
77	72.80	25.07	72.69	25.39	72.58	25.70	72.47	26.02	77
78	73.75	25.39	73.64	25.72	73.53	26.04	73.41	26.36	78
79	74.70	25.72	74.58	26.05	74.47	26.37	74.35	26.70	79
80	75.64	26.05	75.53	26.38	75.41	26.70	75.29	27.03	80
81	76.59	26.37	76.47	26.70	76.35	27.04	76.24	27.37	81
82	77.53	26.70	77.42	27.03	77.30	27.37	77.18	27.71	82
83	78.48	27.02	78.36	27.36	78.24	27.71	78.12	28.05	83
84	79.42	27.35	79.30	27.69	79.18	28.04	79.06	28.39	84
85	80.37	27.67	80.25	28.02	80.12	28.37	80.00	28.72	85
86	81.31	28.00	81.19	28.35	81.07	28.71	80.94	29.06	86
87	82.26	28.32	82.14	28.68	82.01	29.04	81.88	29.40	87
88	83.21	28.65	83.08	29.01	82.95	29.38	82.82	29.74	88
89	84.15	28.98	84.02	29.34	83.90	29.71	83.76	30.07	89
90	85.10	29.30	84.97	29.67	84.84	30.04	84.71	30.41	90
91	86.04	29.63	85.91	30.00	85.78	30.38	85.65	30.75	91
92	86.99	29.95	86.86	30.33	86.72	30.71	86.59	31.09	92
93	87.93	30.28	87.80	30.66	87.67	31.04	87.53	31.43	93
94	88.88	30.60	88.74	30.99	88.61	31.38	88.47	31.76	94
95	89.82	30.93	89.69	31.32	89.55	31.71	89.41	32.10	95
96	90.77	31.25	90.63	31.65	90.49	32.05	90.35	32.44	96
97	91.72	31.58	91.58	31.98	91.44	32.38	91.29	32.78	97
98	92.66	31.91	92.52	32.31	92.38	32.71	92.24	33.12	98
99	93.61	32.23	93.46	32.64	93.32	33.05	93.18	33.45	99
100	94.55	32.56	94.41	32.97	94.26	33.38	94.12	33.79	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	71°.		70¾°.		70½°.		70¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	20°.		20¼°.		20½°.		20¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.94	0.34	0.94	0.35	0.94	0.35	0.94	0.35	1
2	1.88	0.68	1.88	0.69	1.87	0.70	1.87	0.71	2
3	2.82	1.03	2.81	1.04	2.81	1.05	2.81	1.06	3
4	3.76	1.37	3.75	1.38	3.75	1.40	3.74	1.42	4
5	4.70	1.71	4.69	1.73	4.68	1.75	4.68	1.77	5
6	5.64	2.05	5.63	2.08	5.62	2.10	5.61	2.13	6
7	6.58	2.39	6.57	2.42	6.56	2.45	6.55	2.48	7
8	7.52	2.74	7.51	2.77	7.49	2.80	7.48	2.83	8
9	8.46	3.08	8.44	3.12	8.43	3.15	8.42	3.19	9
10	9.40	3.42	9.38	3.46	9.37	3.50	9.35	3.54	10
11	10.34	3.76	10.32	3.81	10.30	3.85	10.29	3.90	11
12	11.28	4.10	11.26	4.15	11.24	4.20	11.22	4.25	12
13	12.22	4.45	12.20	4.50	12.18	4.55	12.16	4.61	13
14	13.16	4.79	13.13	4.85	13.11	4.90	13.09	4.96	14
15	14.10	5.13	14.07	5.19	14.05	5.25	14.03	5.31	15
16	15.04	5.47	15.01	5.54	14.99	5.60	14.96	5.67	16
17	15.97	5.81	15.95	5.88	15.92	5.95	15.90	6.02	17
18	16.91	6.16	16.89	6.23	16.86	6.30	16.83	6.38	18
19	17.85	6.50	17.83	6.58	17.80	6.65	17.77	6.73	19
20	18.79	6.84	18.76	6.92	18.73	7.00	18.70	7.09	20
21	19.73	7.18	19.70	7.27	19.67	7 35	19.64	7.44	21
22	20.67	7.52	20.64	7.61	20.61	7.70	20.57	7.79	22
23	21.61	7.87	21.58	7.96	21.54	8.05	21.51	8.15	23
24	22.55	8.21	22.52	8.31	22.48	8.40	22.44	8.50	24
25	23.49	8.55	23.45	8.65	23.42	8.76	23.38	8.86	25
26	24.43	8.89	24.39	9.00	24.35	9.11	24.31	9.21	26
27	25.37	9.23	25.33	9.35	25.29	9.46	25.25	9.57	27
28	26.31	9.58	26.27	9.69	26.23	9.81	26.18	9.92	28
29	27.25	9.92	27.21	10.04	27.16	10.16	27.12	10.27	29
30	28.19	10.26	28.15	10.38	28.10	10.51	28.05	10.63	30
31	29.13	10.60	29.08	10.73	29.04	10.86	28.99	10.98	31
32	30.07	10.94	30.02	11.08	29.97	11.21	29.92	11.34	32
33	31.01	11.29	30.96	11.42	30.91	11.56	30.86	11.69	33
34	31.95	11.63	31.90	11.77	31.85	11.91	31.79	12.05	34
35	32.89	11.97	32.84	12.11	32.78	12.26	32.73	12.40	35
36	33.83	12.31	33.77	12.46	33.72	12.61	33.66	12.75	36
37	34.77	12.65	34.71	12.81	34.66	12.96	34.60	13.11	37
38	35.71	13.00	35.65	13.15	35.59	13.31	35.54	13.46	38
39	36.65	13.34	36.59	13.50	36.53	13.66	36.47	13.82	39
40	37.59	13.68	37.53	13.84	37.47	14.01	37.41	14.17	40
41	38.53	14.02	38.47	14.19	38.40	14.36	38.34	14.53	41
42	39.47	14.36	39.40	14.54	39.34	14.71	39.28	14.88	42
43	40.41	14.71	40.34	14.88	40.28	15.06	40.21	15.23	43
44	41.35	15.05	41.28	15.23	41.21	15.41	41.15	15.59	44
45	42.29	15.39	42.22	15.58	42.15	15.76	42.08	15.94	45
46	43.23	15.73	43.16	15.92	43.09	16.11	43.02	16.30	46
47	44.17	16.07	44.09	16.27	44.02	16.46	43.95	16.65	47
48	45.11	16.42	45.03	16.61	44.96	16.81	44.89	17.01	48
49	46.04	16.76	45.97	16.96	45.90	17.16	45.82	17.36	49
50	46.98	17.10	46.91	17.31	46.83	17.51	46.76	17.71	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	70°.		69¾°.		69½°.		69¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	20°.		20¼°.		20½°.		20¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	47.92	17.44	47.85	17.65	47.77	17.86	47.69	18.07	51
52	48.86	17.79	48.79	18.00	48.71	18.21	48.63	18.42	52
53	49.80	18.13	49.72	18.34	49.64	18.56	49.56	18.78	53
54	50.74	18.47	50.66	18.69	50.58	18.91	50.50	19.13	54
55	51.68	18.81	51.60	19.04	51.52	19.26	51.43	19.49	55
56	52.62	19.15	52.54	19.38	52.45	19.61	52.37	19.84	56
57	53.56	19.50	53.48	19.73	53.39	19.96	53.30	20.19	57
58	54.50	19.84	54.42	20.07	54.33	20.31	54.24	20.55	58
59	55.44	20.18	55.35	20.42	55.26	20.66	55.17	20.90	59
60	56.38	20.52	56.29	20.77	56.20	21.01	56.11	21.26	60
61	57.32	20.86	57.23	21.11	57.14	21.36	57.04	21.61	61
62	58.26	21.21	58.17	21.46	58.07	21.71	57.98	21.97	62
63	59.20	21.55	59.11	21.81	59.01	22.06	58.91	22.32	63
64	60.14	21.89	60.04	22.15	59.95	22.41	59.85	22.67	64
65	61.08	22.23	60.98	22.50	60.88	22.76	60.78	23.03	65
66	62.02	22.57	61.92	22.84	61.82	23.11	61.72	23.38	66
67	62.96	22.92	62.86	23.19	62.76	23.46	62.65	23.74	67
68	63.90	23.26	63.80	23.54	63.69	23.81	63.59	24.09	68
69	64.84	23.60	64.74	23.88	64.63	24.16	64.52	24.45	69
70	65.78	23.94	65.67	24.23	65.57	24.51	65.46	24.80	70
71	66.72	24.28	66.61	24.57	66.50	24.86	66.39	25.15	71
72	67.66	24.63	67.55	24.92	67.44	25.21	67.33	25.51	72
73	68.60	24.97	68.49	25.27	68.38	25.57	68.26	25.86	73
74	69.54	25.31	69.43	25.61	69.31	25.92	69.20	26.22	74
75	70.48	25.65	70.36	25.96	70.25	26.27	70.14	26.57	75
76	71.42	25.99	71.30	26.30	71.19	26.62	71.07	26.93	76
77	72.36	26.34	72.24	26.65	72.12	26.97	72.01	27.28	77
78	73.30	26.68	73.18	27.00	73.06	27.32	72.94	27.63	78
79	74.24	27.02	74.12	27.34	74.00	27.67	73.88	27.99	79
80	75.18	27.36	75.06	27.69	74.93	28.02	74.81	28.34	80
81	76.12	27.70	75.99	28.04	75.87	28.37	75.75	28.70	81
82	77.05	28.05	76.93	28.38	76.81	28.72	76.68	29.05	82
83	77.99	28.39	77.87	28.73	77.74	29.07	77.62	29.41	83
84	78.93	28.73	78.81	29.07	78.68	29.42	78.55	29.76	84
85	79.87	29.07	79.75	29.42	79.62	29.77	79.49	30.11	85
86	80 81	29.41	80.68	29.77	80.55	30.12	80.42	30.47	86
87	81.75	29.76	81.62	30.11	81.49	30.47	81.36	30.82	87
88	82.69	30.10	82.56	30.46	82.43	30.82	82.29	31.18	88
89	83.63	30.44	83.50	30.80	83.36	31.17	83.23	31.53	89
90	84.57	30.78	84.44	31.15	84.30	31.52	84.16	31.89	90
91	85.51	31.12	85.38	31.50	85.24	31.87	85.10	32.24	91
92	86.45	31.47	86.31	31.84	86.17	32.22	86.03	32.59	92
93	87.39	31.81	87.25	32.19	87.11	32.57	86.97	32.95	93
94	88.33	32.15	88.19	32.54	88.05	32.92	87.90	33.30	94
95	89.27	32.49	89.13	32.88	88.98	33.27	88.84	33.66	95
96	90.21	32.83	90.07	33.23	89.92	33.62	89.77	34.01	96
97	91.15	33.18	91.00	33.57	90.86	33.97	90.71	34.37	97
98	92.09	33.52	91.94	33.92	91.79	34.32	91.64	34.72	98
99	93.03	33.86	92.88	34.27	92.73	34.67	92.58	35.07	99
100	93.97	34.20	93.82	34.61	93.67	35.02	93.51	35.43	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	70°.		69¾°.		69½°.		69¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	21°.		21¼°.		21½°.		21¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.93	0.36	0.93	0.36	0.93	0.37	0.93	0.37	1
2	1.87	0.72	1.86	0.72	1.86	0.73	1.86	0.74	2
3	2.80	1.08	2.80	1.09	2.79	1.10	2.79	1.11	3
4	3.73	1.43	3.73	1.45	3.72	1.47	3.72	1.48	4
5	4.67	1.79	4.66	1.81	4.65	1.83	4.64	1.85	5
6	5.60	2.15	5.59	2.17	5.58	2.20	5.57	2.22	6
7	6.54	2.51	6.52	2.54	6.51	2.57	6.50	2.59	7
8	7.47	2.87	7.46	2.90	7.44	2.93	7.43	2.96	8
9	8.40	3.23	8.39	3.26	8.37	3.30	8.36	3.34	9
10	9.34	3.58	9.32	3.62	9.30	3.67	9.29	3.71	10
11	10.27	3.94	10.25	3.99	10.23	4.03	10.22	4.08	11
12	11.20	4.30	11.18	4.35	11.17	4.40	11.15	4.45	12
13	12.14	4.66	12.12	4.71	12.10	4.76	12.07	4.82	13
14	13.07	5.02	13.05	5.07	13.03	5.13	13.00	5.19	14
15	14.00	5.38	13.98	5.44	13.96	5.50	13.93	5.56	15
16	14.94	5.73	14.91	5.80	14.89	5.86	14.86	5.93	16
17	15.87	6.09	15.84	6.16	15.82	6.23	15.79	6.30	17
18	16.80	6.45	16.78	6.52	16.75	6.60	16.72	6.67	18
19	17.74	6.81	17.71	6.89	17.68	6.96	17.65	7.04	19
20	18.67	7.17	18.64	7.25	18.61	7.33	18.58	7.41	20
21	19.61	7.53	19.57	7.61	19.54	7.70	19.51	7.78	21
22	20.54	7.88	20.50	7.97	20.47	8.06	20.43	8.15	22
23	21.47	8.24	21.44	8.34	21.40	8.43	21.36	8.52	23
24	22.41	8.60	22.37	8.70	22.33	8.80	22.29	8.89	24
25	23.34	8.96	23.30	9.06	23.26	9.16	23.22	9.26	25
26	24.27	9.32	24.23	9.42	24.19	9.53	24.15	9.63	26
27	25.21	9.68	25.16	9.79	25.12	9.90	25.08	10.01	27
28	26.14	10.03	26.10	10.15	26.05	10.26	26.01	10.38	28
29	27.07	10.39	27.03	10.51	26.98	10.63	26.94	10.75	29
30	28.01	10.75	27.96	10.87	27.91	11.00	27.86	11.12	30
31	28.94	11.11	28.89	11.24	28.84	11.36	28.79	11.49	31
32	29.87	11.47	29.82	11.60	29.77	11.73	29.72	11.86	32
33	30.81	11.83	30.76	11.96	30.70	12.09	30.65	12.23	33
34	31.74	12.18	31.69	12.32	31.63	12.46	31.58	12.60	34
35	32.68	12.54	32.62	12.69	32.56	12.83	32.51	12.97	35
36	33.61	12.90	33.55	13.05	33.50	13.19	33.44	13.34	36
37	34.54	13.26	34.48	13.41	34.43	13.56	34.37	13.71	37
38	35.48	13.62	35.42	13.77	35.36	13.93	35.29	14.08	38
39	36.41	13.98	36.35	14.14	36.29	14.29	36.22	14.45	39
40	37.34	14.33	37.28	14.50	37.22	14.66	37.15	14.82	40
41	38.28	14.69	38.21	14.86	38.15	15.03	38.08	15.19	41
42	39.21	15.05	39.14	15.22	39.08	15.39	39.01	15.56	42
43	40.14	15.41	40.08	15.58	40.01	15.76	39.94	15.93	43
44	41.08	15.77	41.01	15.95	40.94	16.13	40.87	16.30	44
45	42.01	16.13	41.94	16.31	41.87	16.49	41.80	16.68	45
46	42.94	16.48	42.87	16.67	42.80	16.86	42.73	17.05	46
47	43.88	16.84	43.80	17.03	43.73	17.23	43.65	17.42	47
48	44.81	17.20	44.74	17.40	44.66	17.59	44.58	17.79	48
49	45.75	17.56	45.67	17.76	45.59	17.96	45.51	18.16	49
50	46.68	17.92	46.60	18.12	46.52	18.33	46.44	18.53	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	69°.		68¾°.		68½°.		68¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	21°.		21¼°.		21½°.		21¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	47.61	18.28	47.53	18.48	47.45	18.69	47.37	18.90	51
52	48.55	18.64	48.46	18.85	48.38	19.06	48.30	19.27	52
53	49.48	18.99	49.40	19.21	49.31	19.42	49.23	19.64	53
54	50.41	19.35	50.33	19.57	50.24	19.79	50.16	20.01	54
55	51.35	19.71	51.26	19.93	51.17	20.16	51.08	20.38	55
56	52.28	20.07	52.19	20.30	52.10	20.52	52.01	20.75	56
57	53.21	20.43	53.12	20.66	53.03	20.89	52.94	21.12	57
58	54.15	20.79	54.06	21.02	53.96	21.26	53.87	21.49	58
59	55.08	21.14	54.99	21.38	54.89	21.62	54.80	21.86	59
60	56.01	21.50	55.92	21.75	55.83	21.99	55.73	22.23	60
61	56.95	21.86	56.85	22.11	56.76	22.36	56.66	22.60	61
62	57.88	22.22	57.78	22.47	57.69	22.72	57.59	22.97	62
63	58.82	22.58	58.72	22.83	58.62	23.09	58.52	23.35	63
64	59.75	22.94	59.65	23.20	59.55	23.46	59.44	23.72	64
65	60.68	23.29	60.58	23.56	60.48	23.82	60.37	24.09	65
66	61.62	23.65	61.51	23.92	61.41	24.19	61.30	24.46	66
67	62.55	24.01	62.44	24.28	62.34	24.56	62.23	24.83	67
68	63.48	24.37	63.38	24.65	63.27	24.92	63.16	25.20	68
69	64.42	24.73	64.31	25.01	64.20	25.29	64.09	25.57	69
70	65.35	25.09	65.24	25.37	65.13	25.66	65.02	25.94	70
71	66.28	25.44	66.17	25.73	66.06	26.02	65.95	26.31	71
72	67.22	25.80	67.10	26.10	66.99	26.39	66.87	26.68	72
73	68.15	26.16	68.04	26.46	67.92	26.75	67.80	27.05	73
74	69.08	26.52	68.97	26.82	68.85	27.12	68.73	27.42	74
75	70.02	26.88	69.90	27.18	69.78	27.49	69.66	27.79	75
76	70.95	27.24	70.83	27.55	70.71	27.85	70.59	28.16	76
77	71.89	27.59	71.76	27.91	71.64	28.22	71.52	28.53	77
78	72.82	27.95	72.70	28.27	72.57	28.59	72.45	28.90	78
79	73.75	28.31	73.63	28.63	73.50	28.95	73.38	29.27	79
80	74.69	28.67	74.56	29.00	74.43	29.32	74.30	29.64	80
81	75.62	29.03	75.49	29.36	75.36	29.69	75.23	30.02	81
82	76.55	29.39	76.42	29.72	76.29	30.05	76.16	30.39	82
83	77.49	29.74	77.36	30.08	77.22	30.42	77.09	30.76	83
84	78.42	30.10	78.29	30.44	78.16	30.79	78.02	31.13	84
85	79.35	30.46	79.22	30.81	79.09	31.15	78.95	31.50	85
86	80.29	30.82	80.15	31.17	80.02	31.52	79.88	31.87	86
87	81.22	31.18	81.08	31.53	80.95	31.89	80.81	32.24	87
88	82.16	31.54	82.02	31.89	81.88	32.25	81.74	32.61	88
89	83.09	31.89	82.95	32.26	82.81	32.62	82.66	32.98	89
90	84.02	32.25	83.88	32.62	83.74	32.99	83.59	33.35	90
91	84.96	32.61	84.81	32.98	84.67	33.35	84.52	33.72	91
92	85.89	32.97	85.74	33.34	85.60	33.72	85.45	34.09	92
93	86.82	33.33	86.68	33.71	86.53	34.08	86.38	34.46	93
94	87.76	33.69	87.61	34.07	87.46	34.45	87.31	34.83	94
95	88.69	34.04	88.54	34.43	88.39	34.82	88.24	35.20	95
96	89.62	34.40	89.47	34.79	89.32	35.18	89.17	35.57	96
97	90.56	34.76	90.40	35.16	90.25	35.55	90.09	35.94	97
98	91.49	35.12	91.34	35.52	91.18	35.92	91.02	36.31	98
99	92.42	35.48	92.27	35.88	92.11	36.28	91.95	36.69	99
100	93.36	35.84	93.20	36.24	93.04	36.65	92.88	37.06	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	69°.		68¾°.		68½°.		68¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	22°.		22¼°.		22½°.		22¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.93	0.37	0.93	0.38	0.92	0.38	0.92	0.39	1
2	1.85	0.75	1.85	0.76	1.85	0.77	1.84	0.77	2
3	2.78	1.12	2.78	1.14	2.77	1.15	2.77	1.16	3
4	3.71	1.50	3.70	1.51	3.70	1.53	3.69	1.55	4
5	4.64	1.87	4.63	1.89	4.62	1.91	4.61	1.93	5
6	5.56	2.25	5.55	2.27	5.54	2.30	5.53	2.32	6
7	6.49	2.62	6.48	2.65	6.47	2.68	6.46	2.71	7
8	7.42	3.00	7.40	3.03	7.39	3.06	7.38	3.09	8
9	8.34	3.37	8.33	3.41	8.31	3.44	8.30	3.48	9
10	9.27	3.75	9.26	3.79	9.24	3.83	9.22	3.87	10
11	10.20	4.12	10.18	4.17	10.16	4.21	10.14	4.25	11
12	11.13	4.50	11.11	4.54	11.09	4.59	11.07	4.64	12
13	12.05	4.87	12.03	4.92	12.01	4.97	11.99	5.03	13
14	12.98	5.24	12.96	5.30	12.93	5.36	12.91	5.41	14
15	13.91	5.62	13.88	5.68	13.86	5.74	13.83	5.80	15
16	14.83	5.99	14.81	6.06	14.78	6.12	14.76	6.19	16
17	15.76	6.37	15.73	6.44	15.71	6.51	15.68	6.57	17
18	16.69	6.74	16.66	6.82	16.63	6.89	16.60	6.96	18
19	17.62	7.12	17.59	7.19	17.55	7.27	17.52	7.35	19
20	18.54	7.49	18.51	7.57	18.48	7.65	18.44	7.73	20
21	19.47	7.87	19.44	7.95	19.40	8.04	19.37	8.12	21
22	20.40	8.24	20.36	8.33	20.33	8.42	20.29	8.51	22
23	21.33	8.62	21.29	8.71	21.25	8.80	21.21	8.89	23
24	22.25	8.99	22.21	9.09	22.17	9.18	22.13	9.28	24
25	23.18	9.37	23.14	9.47	23.10	9.57	23.06	9.67	25
26	24.11	9.74	24.06	9.84	24.02	9.95	23.98	10.05	26
27	25.03	10.11	24.99	10.22	24.94	10.33	24.90	10.44	27
28	25.96	10.49	25.92	10.60	25.87	10.72	25.82	10.83	28
29	26.89	10.86	26.84	10.98	26.79	11.10	26.74	11.21	29
30	27.82	11.24	27.77	11.36	27.72	11.48	27.67	11.60	30
31	28.74	11.61	28.69	11.74	28.64	11.86	28.59	11.99	31
32	29.67	11.99	29.62	12.12	29.56	12.25	29.51	12.37	32
33	30.60	12.36	30.54	12.50	30.49	12.63	30.43	12.76	33
34	31.52	12.74	31.47	12.87	31.41	13.01	31.35	13.15	34
35	32.45	13.11	32.39	13.25	32.34	13.39	32.28	13.53	35
36	33.38	13.49	33.32	13.63	33.26	13.78	33.20	13.92	36
37	34.31	13.86	34.24	14.01	34.18	14.16	34.12	14.31	37
38	35.23	14.24	35.17	14.39	35.11	14.54	35.04	14.70	38
39	36.16	14.61	36.10	14.77	36.03	14.92	35.97	15.08	39
40	37.09	14.98	37.02	15.15	36.96	15.31	36.89	15.47	40
41	38.01	15.36	37.95	15.52	37.88	15.69	37.81	15.86	41
42	38.94	15.73	38.87	15.90	38.80	16.07	38.73	16.24	42
43	39.87	16.11	39.80	16.28	39.73	16.46	39.65	16.63	43
44	40.80	16.48	40.72	16.66	40.65	16.84	40.58	17.02	44
45	41.72	16.86	41.65	17.04	41.57	17.22	41.50	17.40	45
46	42.65	17.23	42.57	17.42	42.50	17.60	42.42	17.79	46
47	43.58	17.61	43.50	17.80	43.42	17.99	43.34	18.18	47
48	44.50	17.98	44.43	18.18	44.35	18.37	44.27	18.56	48
49	45.43	18.36	45.35	18.55	45.27	18.75	45.19	18.95	49
50	46.36	18.73	46.28	18.93	46.19	19.13	46.11	19.34	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	68°.		67¾°.		67½°.		67¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	22°.		22¼°.		22½°.		22¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	47.29	19.10	47.20	19.31	47.12	19.52	47.03	19.72	51
52	48.21	19.48	48.13	19.69	48.04	19.90	47.95	20.11	52
53	49.14	19.85	49.05	20.07	48.97	20.28	48.88	20.50	53
54	50.07	20.23	49.98	20.45	49.89	20.66	49.80	20.88	54
55	51.00	20.60	50.90	20.83	50.81	21.05	50.72	21.27	55
56	51.92	20.98	51.83	21.20	51.74	21.43	51.64	21.66	56
57	52.85	21.35	52.76	21.58	52.66	21.81	52.57	22.04	57
58	53.78	21.73	53.68	21.96	53.59	22.20	53.49	22.43	58
59	54.70	22.10	54.61	22.34	54.51	22.58	54.41	22.82	59
60	55.63	22.48	55.53	22.72	55.43	22.96	55.33	23.20	60
61	56.56	22.85	56.46	23.10	56.36	23.34	56.25	23.59	61
62	57.49	23.23	57.38	23.48	57.28	23.73	57.18	23.98	62
63	58.41	23.60	58.31	23.85	58.20	24.11	58.10	24.36	63
64	59.34	23.97	59.23	24.23	59.13	24.49	59.02	24.75	64
65	60 27	24.35	60.16	24.61	60.05	24.87	59.94	25.14	65
66	61.19	24.72	61.09	24.99	60.98	25.26	60.87	25.52	66
67	62.12	25.10	62.01	25.37	61.90	25.64	61.79	25.91	67
68	63.05	25.47	62.94	25.75	62.82	26.02	62.71	26.30	68
69	63.98	25.85	63.86	26.13	63.75	26.41	63.63	26.68	69
70	64.90	26.22	64.79	26.51	64.67	26.79	64.55	27.07	70
71	65.83	26.60	65.71	26.88	65.60	27.17	65.48	27.46	71
72	66.76	26.97	66.64	27.26	66.52	27.55	66.40	27.84	72
73	67.68	27.35	67.56	27.64	67.44	27.94	67.32	28.23	73
74	68.61	27.72	68.49	28.02	68.37	28.32	68.24	28.62	74
75	69.54	28.10	69.42	28.40	69.29	28.70	69.17	29.00	75
76	70.47	28.47	70.34	28.78	70.21	29.08	70.09	29.39	76
77	71.39	28.84	71.27	29.16	71.14	29.47	71.01	29.78	77
78	72.32	29.22	72.19	29.53	72.06	29.85	71.93	30.16	78
79	73.25	29.59	73.12	29.91	72.99	30.23	72.85	30.55	79
80	74.17	29.97	74.04	30.29	73.91	30.61	73.78	30.94	80
81	75.10	30.34	74.97	30.67	74.83	31.00	74.70	31.32	81
82	76.03	30.72	75.89	31.05	75.76	31.38	75.62	31.71	82
83	76.96	31.09	76.82	31.43	76.68	31.76	76.54	32.10	83
84	77.88	31.47	77.75	31.81	77.61	32.15	77.46	32.48	84
85	78.81	31.84	78.67	32.19	78.53	32.53	78.39	32.87	85
86	79.74	32.22	79.60	32.56	79.45	32.91	79.31	33.26	86
87	80.66	32.59	80.52	32.94	80.38	33.29	80.23	33.64	87
88	81.59	32.97	81.45	33.32	81.30	33.68	81.15	34.03	88
89	82.52	33.34	82.37	33.70	82.23	34.06	82.08	34.42	89
90	83.45	33.71	83.30	34.08	83.15	34.44	83.00	34.80	90
91	84.37	34.09	84.22	34.46	84.07	34.82	83.92	35.19	91
92	85.30	34.46	85.15	34.84	85.00	35.21	84.84	35.58	92
93	86.23	34.84	86.08	35.21	85.92	35.59	85.76	35.96	93
94	87.16	35.21	87.00	35.59	86.84	35.97	86.69	36.35	94
95	88.08	35.59	87.93	35.97	87.77	36.35	87.61	36.74	95
96	89.01	35.96	88.85	36.35	88.69	36.74	88.53	37.12	96
97	89.94	36.34	89.78	36.73	89.62	37.12	89.45	37.51	97
98	90.86	36.71	90.70	37.11	90.54	37.50	90.38	37.90	98
99	91.79	37.09	91.63	37.49	91.46	37.89	91.30	38.28	99
100	92.72	37.46	92.55	37.86	92.39	38.27	92.22	38.67	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	68°.		67¾°.		67½°.		67¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	23°.		23¼°.		23½°.		23¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.92	0.39	0.92	0.39	0.92	0.40	0.92	0.40	1
2	1.84	0.78	1.84	0.79	1.83	0.80	1.83	0.81	2
3	2.76	1.17	2.76	1.18	2.75	1.20	2.75	1.21	3
4	3.68	1.56	3.68	1.58	3.67	1.59	3.66	1.61	4
5	4.60	1.95	4.59	1.97	4.59	1.99	4.58	2.01	5
6	5.52	2.34	5.51	2.37	5.50	2.39	5.49	2.42	6
7	6.44	2.74	6.43	2.76	6.42	2.79	6.41	2.82	7
8	7.36	3.13	7.35	3.16	7.34	3.19	7.32	3.22	8
9	8.28	3.52	8.27	3.55	8.25	3.59	8.24	3.62	9
10	9.21	3.91	9.19	3.95	9.17	3.99	9.15	4.03	10
11	10.13	4.30	10.11	4.34	10.09	4.39	10.07	4.43	11
12	11.05	4.69	11.03	4.74	11.00	4.78	10.98	4.83	12
13	11.97	5.08	11.94	5.13	11.92	5.18	11.90	5.24	13
14	12.89	5.47	12.86	5.53	12.84	5.58	12.81	5.64	14
15	13.81	5.86	13.78	5.92	13.76	5.98	13.73	6.04	15
16	14.73	6.25	14.70	6.32	14.67	6.38	14.64	6.44	16
17	15.65	6.64	15.62	6.71	15.59	6.78	15.56	6.85	17
18	16.57	7.03	16.54	7.11	16.51	7.18	16.48	7.25	18
19	17.49	7.42	17.46	7.50	17.42	7.58	17.39	7.65	19
20	18.41	7.81	18.38	7.89	18.34	7.97	18.31	8.05	20
21	19.33	8.21	19.29	8.29	19.26	8.37	19.22	8.46	21
22	20.25	8.60	20.21	8.68	20.18	8.77	20.14	8.86	22
23	21.17	8.99	21.13	9.08	21.09	9.17	21.05	9.26	23
24	22.09	9.38	22.05	9.47	22.01	9.57	21.97	9.67	24
25	23.01	9.77	22.97	9.87	22.93	9.97	22.88	10.07	25
26	23.93	10.16	23.89	10.26	23.84	10.37	23.80	10.47	26
27	24.85	10.55	24.81	10.66	24.76	10.77	24.71	10.87	27
28	25.77	10.94	25.73	11.05	25.68	11.16	25.63	11.28	28
29	26.69	11.33	26.64	11.45	26.59	11.56	26.54	11.68	29
30	27.62	11.72	27.56	11.84	27.51	11.96	27.46	12.08	30
31	28.54	12.11	28.48	12.24	28.43	12.36	28.37	12.49	31
32	29.46	12.50	29.40	12.63	29.35	12.76	29.29	12.89	32
33	30.38	12.89	30.32	13.03	30.26	13.16	30.21	13.29	33
34	31.30	13.28	31.24	13.42	31.18	13.56	31.12	13.69	34
35	32.22	13.68	32.16	13.82	32.10	13.96	32.04	14.10	35
36	33.14	14.07	33.08	14.21	33.01	14.35	32.95	14.50	36
37	34.06	14.46	34.00	14.61	33.93	14.75	33.87	14.90	37
38	34.98	14.85	34.91	15.00	34.85	15.15	34.78	15.30	38
39	35.90	15.24	35.83	15.40	35.77	15.55	35.70	15.71	39
40	36.82	15.63	36.75	15.79	36.68	15.95	36.61	16.11	40
41	37.74	16.02	37.67	16.18	37.60	16.35	37.53	16.51	41
42	38.66	16.41	38.59	16.58	38.52	16.75	38.44	16.92	42
43	39.58	16.80	39.51	16.97	39.43	17.15	39.36	17.32	43
44	40.50	17.19	40.43	17.37	40.35	17.54	40.27	17.72	44
45	41.42	17.58	41.35	17.76	41.27	17.94	41.19	18.12	45
46	42.34	17.97	42.26	18.16	42.18	18.34	42.10	18.53	46
47	43.26	18.36	43.18	18.55	43.10	18.74	43.02	18.93	47
48	44.18	18.76	44.10	18.95	44.02	19.14	43.93	19.33	48
49	45.10	19.15	45.02	19.34	44.94	19.54	44.85	19.73	49
50	46.03	19.54	45.94	19.74	45.85	19.94	45.77	20.14	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	67°.		66¾°.		66½°.		66¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	23°.		23¼°.		23½°.		23¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	46.95	19.93	46.86	20.13	46.77	20.34	46.68	20.54	51
52	47.87	20.32	47.78	20.53	47.69	20.73	47.60	20.94	52
53	48.79	20.71	48.70	20.92	48.60	21.13	48.51	21.35	53
54	49.71	21.10	49.61	21.32	49.52	21.53	49.43	21.75	54
55	50.63	21.49	50.53	21.71	50.44	21.93	50.34	22.15	55
56	51.55	21.88	51.45	22.11	51.36	22.33	51.26	22.55	56
57	52.47	22.27	52.37	22.50	52.27	22.73	52.17	22.96	57
58	53.39	22.66	53.29	22.90	53.19	23.13	53.09	23.36	58
59	54.31	23.05	54.21	23.29	54.11	23.53	54.00	23.76	59
60	55.23	23.44	55.13	23.68	55.02	23.92	54.92	24.16	60
61	56.15	23.83	56.05	24.08	55.94	24.32	55.83	24.57	61
62	57.07	24.23	56.97	24.47	56.86	24.72	56.75	24.97	62
63	57.99	24.62	57.88	24.87	57.77	25.12	57.66	25.37	63
64	58.91	25.01	58.80	25.26	58.69	25.52	58.58	25.78	64
65	59.83	25.40	59.72	25.66	59.61	25.92	59.50	26.18	65
66	60.75	25.79	60.64	26.05	60.53	26.32	60.41	26.58	66
67	61.67	26.18	61.56	26.45	61.44	26.72	61.33	26.98	67
68	62.59	26.57	62.48	26.84	62.36	27.11	62.24	27.39	68
69	63.51	26.96	63.40	27.24	63.28	27.51	63.16	27.79	69
70	64.44	27.35	64.32	27.63	64.19	27.91	64.07	28.19	70
71	65.36	27.74	65.23	28.03	65.11	28.31	64.99	28.60	71
72	66.28	28.13	66.15	28.42	66.03	28.71	65.90	29.00	72
73	67.20	28.52	67.07	28.82	66.95	29.11	66.82	29.40	73
74	68.12	28.91	67.99	29.21	67.86	29.51	67.73	29.80	74
75	69.04	29.30	68.91	29.61	68.78	29.91	68.65	30.21	75
76	69.96	29.70	69.83	30.00	69.70	30.30	69.56	30.61	76
77	70.88	30.09	70.75	30.40	70.61	30.70	70.48	31.01	77
78	71.80	30.48	71.67	30.79	71.53	31.10	71.39	31.41	78
79	72.72	30.87	72.58	31.18	72.45	31.50	72.31	31.82	79
80	73.64	31.26	73.50	31.58	73.36	31.90	73.22	32.22	80
81	74.56	31.65	74.42	31.97	74.28	32.30	74.14	32.62	81
82	75.48	32.04	75.34	32.37	75.20	32.70	75.06	33.03	82
83	76.40	32.43	76.26	32.76	76.12	33.10	75.97	33.43	83
84	77.32	32.82	77.18	33.16	77.03	33.49	76.89	33.83	84
85	78.24	33.21	78.10	33.55	77.95	33.89	77.80	34.23	85
86	79.16	33.60	79.02	33.95	78.87	34.29	78.72	34.64	86
87	80.08	33.99	79.93	34.34	79.78	34.69	79.63	35.04	87
88	81.00	34.38	80.85	34.74	80.70	35.09	80.55	35.44	88
89	81.92	34.78	81.77	35.13	81.62	35.49	81.46	35.84	89
90	82.85	35.17	82.69	35.53	82.54	35.89	82.38	36.25	90
91	83.77	35.56	83.61	35.92	83.45	36.29	83.29	36.65	91
92	84.69	35.95	84.53	36.32	84.37	36.68	84.21	37.05	92
93	85.61	36.34	85.45	36.71	85.29	37.08	85.12	37.46	93
94	86.53	36.73	86.37	37.11	86.20	37.48	86.04	37.86	94
95	87.45	37.12	87.29	37.50	87.12	37.88	86.95	38.26	95
96	88.37	37.51	88.20	37.90	88.04	38.28	87.87	38.66	96
97	89.29	37.90	89.12	38.29	88.95	38.68	88.79	39.07	97
98	90.21	38.29	90.04	38.68	89.87	39.08	89.70	39.47	98
99	91.13	38.68	90.96	39.08	90.79	29.48	90.62	39.87	99
100	92.05	39.07	91.88	39.47	91.71	29.87	91.53	40.27	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	67°.		66¾°.		66½°.		66¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	24°.		24¼°.		24½°.		24¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.91	0.41	0.91	0.41	0.91	0.41	0.91	0.42	1
2	1.83	0.81	1.82	0.82	1.82	0.83	1.82	0.84	2
3	2.74	1.22	2.74	1.23	2.73	1.24	2.72	1.26	3
4	3.65	1.63	3.65	1.64	3.64	1.66	3.63	1.67	4
5	4.57	2 03	4.56	2.05	4.55	2.07	4.54	2.09	5
6	5.48	2.44	5.47	2.46	5.46	2.49	5.45	2.51	6
7	6.39	2.85	6.38	2.88	6.37	2.90	6.36	2.93	7
8	7.31	3.25	7.29	3.29	7.28	3.32	7.27	3.35	8
9	8.22	3.66	8.21	3.70	8.19	3.73	8.17	3.77	9
10	9.14	4.07	9.12	4.11	9.10	4.15	9.08	4.19	10
11	10.05	4.47	10.03	4.52	10.01	4.56	9.99	4.61	11
12	10.96	4.88	10.94	4.93	10.92	4.98	10.90	5.02	12
13	11.88	5.29	11.85	5.34	11.83	5.39	11.81	5.44	13
14	12.79	5.69	12.76	5.75	12.74	5.81	12.71	5.86	14
15	13.70	6.10	13.68	6.16	13.65	6.22	13.62	6.28	15
16	14.62	6.51	14.59	6.57	14.56	6.64	14.53	6.70	16
17	15.53	6.91	15.50	6.98	15.47	7.05	15.44	7.12	17
18	16.44	7.32	16.41	7.39	16.38	7.46	16.35	7.54	18
19	17.36	7.73	17.32	7.80	17.29	7.88	17.25	7.95	19
20	18.27	8.13	18.24	8.21	18.20	8.29	18.16	8.37	20
21	19.18	8.54	19.15	8.63	19.11	8.71	19.07	8.79	21
22	20.10	8.95	20.06	9.04	20.02	9.12	19.98	9.21	22
23	21.01	9.35	20.97	9.45	20.93	9.54	20.89	9.63	23
24	21.93	9.76	21.88	9.86	21.84	9.95	21.80	10.05	24
25	22.84	10.17	22.79	10.27	22.75	10.37	22.70	10.47	25
26	23.75	10.58	23.71	10.68	23.66	10.78	23.61	10.89	26
27	24.67	10.98	24.62	11.09	24.57	11.20	24.52	11.30	27
28	25.58	11.39	25.53	11.50	25.48	11.61	25.43	11.72	28
29	26.49	11.80	26.44	11.91	26.39	12.03	26.34	12.14	29
30	27.41	12.20	27.35	12.32	27.30	12.44	27.24	12.56	30
31	28.32	12.61	28.26	12.73	28.21	12.86	28.15	12.98	31
32	29.23	13.02	29.18	13.14	29.12	13.27	29.06	13.40	32
33	30.15	13.42	30.09	13.55	30.03	13.68	29.97	13.82	33
34	31.06	13.83	31.00	13.96	30.94	14.10	30.88	14.23	34
35	31.97	14.24	31.91	14.38	31.85	14.51	31.79	14.65	35
36	32.89	14.64	32.82	14.79	32.76	14.93	32.69	15.07	36
37	33.80	15.05	33.74	15.20	33.67	15.34	33.60	15.49	37
38	34.71	15.46	34.65	15.61	34.58	15.76	34.51	15.91	38
39	35.63	15.86	35.56	16.02	35.49	16.17	35.42	16.33	39
40	36.54	16.27	36.47	16.43	36.40	16.59	36.33	16.75	40
41	37.46	16.68	37.38	16.84	37.31	17.00	37.23	17.17	41
42	38.37	17.08	38.29	17.25	38.22	17.42	38.14	17.58	42
43	39.28	17.49	39.21	17.66	39.13	17.83	39.05	18.00	43
44	40.20	17.90	40.12	18.07	40.04	18.25	39.96	18.42	44
45	41.11	18.30	41.03	18.48	40.95	18.66	40.87	18.84	45
46	42.02	18.71	41.94	18.89	41.86	19.08	41.77	19.26	46
47	42.94	19.12	42.85	19.30	42.77	19.49	42.68	19.68	47
48	43.85	19.52	43.76	19.71	43.68	19.91	43.59	20.10	48
49	44.76	19.93	44.68	20.13	44.59	20.32	44.50	20.51	49
50	45.68	20.34	45.59	20.54	45.50	20.73	45.41	20.93	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	66°.		65¾°.		65½°.		65¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	24°.		24¼°.		24½°.		24¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	46.59	20.74	46.50	20.95	46.41	21.15	46.32	21.35	51
52	47.50	21.15	47.41	21.36	47.32	21.56	47.22	21.77	52
53	48.42	21.56	48.32	21.77	48.23	21.98	48.13	22.19	53
54	49.33	21.96	49.24	22.18	49.14	22.39	49.04	22.61	54
55	50.25	22.37	50.15	22.59	50.05	22.81	49.95	23.03	55
56	51.16	22.78	51.06	23.00	50.96	23.22	50.86	23.44	56
57	52.07	23.18	51.97	23.41	51.87	23.64	51.76	23.86	57
58	52.99	23.59	52.88	23.82	52.78	24.05	52.67	24.28	58
59	53.90	24.00	53.79	24.23	53.69	24.47	53.58	24.70	59
60	54.81	24.40	54.71	24.64	54.60	24.88	54.49	25.12	60
61	55.73	24.81	55.62	25.05	55.51	25.30	55.40	25.54	61
62	56.64	25.22	56.53	25.46	56.42	25.71	56.30	25.96	62
63	57.55	25.62	57.44	25.88	57.33	26.13	57.21	26.38	63
64	58.47	26.03	58.35	26.29	58.24	26.54	58.12	26.79	64
65	59.38	26.44	59.26	26.70	59.15	26.96	59.03	27.21	65
66	60.29	26.84	60.18	27.11	60.06	27.37	59.94	27.63	66
67	61.21	27.25	61.09	27.52	60.97	27.78	60.85	28.05	67
68	62.12	27.66	62.00	27.93	61.88	28.20	61.75	28.47	68
69	63.03	28.06	62.91	28.34	62.79	28.61	62.66	28.89	69
70	63.95	28.47	63.82	28.75	63.70	29.03	63.57	29.31	70
71	64.86	28.88	64.74	29.16	64.61	29.44	34.48	29.72	71
72	65.78	29.29	65.65	29.57	65.52	29.86	65.39	30.14	72
73	66.69	29.69	66.56	29.98	66.43	30.27	66.29	30.56	73
74	67.60	30.10	67.47	30.39	67.34	30.69	67.20	30.98	74
75	68.52	30.51	68.38	30.80	68.25	31.10	68.11	31.40	75
76	69.43	30.91	69.29	31.21	69.16	31.52	69.02	31.82	76
77	70.34	31.32	70.21	31.63	70.07	31.93	69.93	32.24	77
78	71.26	31.73	71.12	32.04	70.98	32.35	70.84	32.66	78
79	72.17	32.13	72.03	32.45	71.89	32.76	71.74	33.07	79
80	73.08	32.54	72.94	32.86	72.80	33.18	72.65	33.49	80
81	74.00	32.95	73.85	33.27	73.71	33.59	73.56	33.91	81
82	74.91	33.35	74.76	33.68	74.62	34.00	74.47	34.33	82
83	75.82	33.76	75.68	34.09	75.53	34.42	75.38	34.75	83
84	76.74	34.17	76.59	34.50	76.44	34.83	76.28	35.17	84
85	77.65	34.57	77.50	34.91	77.35	35.25	77.19	35.59	85
86	78.56	34.98	78.41	35.32	78.26	35.66	78.10	36.00	86
87	79.48	35.39	79.32	35.73	79.17	36.08	79.01	36.42	87
88	80.39	35.79	80.24	36.14	80.08	36.49	79.92	36.84	88
89	81.31	36.20	81.15	36.55	80.99	36.91	80.82	37.26	89
90	82.22	36.61	82.06	36.96	81.90	37.32	81.73	37.68	90
91	83.13	37.01	82.97	37.38	82.81	37.74	82.64	38.10	91
92	84.05	37.42	83.88	37.79	83.72	38.15	83.55	38.52	92
93	84.96	37.83	84.79	38.20	84.63	38.57	84.46	38.94	93
94	85.87	38.23	85.71	38.61	85.54	38.98	85.37	39.35	94
95	86.79	38.64	86.62	39.02	86.45	39.40	86.27	39.77	95
96	87.70	39.05	87.53	39.43	87.36	39.81	87.18	40.19	96
97	88.61	39.45	88.44	39.84	88.27	40.23	88.09	40.61	97
98	89.53	39.86	89.35	40.25	89.18	40.64	89.00	41.03	98
99	90.44	40.27	90.26	40.66	90.09	41.05	89.91	41.45	99
100	91.35	40.67	91.18	41.07	91.00	41.47	90.81	41.87	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	66°.		65¾°.		65½°.		65¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	25°.		25¼°.		25½°.		25¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.91	0.42	0.90	0.43	0.90	0.43	0.90	0.43	1
2	1.81	0.85	1.81	0.85	1.81	0.86	1.80	0.87	2
3	2.72	1.27	2.71	1.28	2.71	1.29	2.70	1.30	3
4	3.63	1.69	3.62	1.71	3.61	1.72	3.60	1.74	4
5	4.53	2.11	4.52	2.13	4.51	2.15	4.50	2.17	5
6	5.44	2.54	5.43	2.56	5.42	2.58	5.40	2.61	6
7	6.34	2.96	6.33	2.99	6.32	3.01	6.30	3.04	7
8	7.25	3.38	7.24	3.41	7.22	3.44	7.21	3.48	8
9	8.16	3.80	8.14	3.84	8.12	3.87	8.11	3.91	9
10	9.06	4.23	9.04	4.27	9.03	4.31	9.01	4.34	10
11	9.97	4.65	9.95	4.69	9.93	4.74	9.91	4.78	11
12	10.88	5.07	10.85	5.12	10.83	5.17	10.81	5.21	12
13	11.78	5.49	11.76	5.55	11.73	5.60	11.71	5.65	13
14	12.69	5.92	12.66	5.97	12.64	6.03	12.61	6.08	14
15	13.59	6.34	13.57	6.40	13.54	6.46	13.51	6.52	15
16	14.50	6.76	14.47	6.83	14.44	6.89	14.41	6.95	16
17	15.41	7.18	15.38	7.25	15.34	7.32	15.31	7.39	17
18	16.31	7.61	16.28	7.68	16.25	7.75	16.21	7.82	18
19	17.22	8.03	17.18	8.10	17.15	8.18	17.11	8.25	19
20	18.13	8.45	18.09	8.53	18.05	8.61	18.01	8.69	20
21	19.03	8.87	18.99	8.96	18.95	9.04	18.91	9.12	21
22	19.94	9.30	19.90	9.38	19.86	9.47	19.82	9.56	22
23	20.85	9.72	20.80	9.81	20.76	9.90	20.72	9.99	23
24	21.75	10.14	21.71	10.24	21.66	10.33	21.62	10.43	24
25	22.66	10.57	22.61	10.66	22.56	10.76	22.52	10.86	25
26	23.56	10.99	23.52	11.09	23.47	11.19	23.42	11.30	26
27	24.47	11.41	24.42	11.52	24.37	11.62	24.32	11.73	27
28	25.38	11.83	25.32	11.94	25.27	12.05	25.22	12.16	28
29	26.28	12.26	26.23	12.37	26.17	12.48	26.12	12.60	29
30	27.19	12.68	27.13	12.80	27.08	12.92	27.02	13.03	30
31	28.10	13.10	28.04	13.22	27.98	13.35	27.92	13.47	31
32	29.00	13.52	28.94	13.65	28.88	13.78	28.82	13.90	32
33	29.91	13.95	29.85	14.08	29.79	14.21	29.72	14.34	33
34	30.81	14.37	30.75	14.50	30.69	14.64	30.62	14.77	34
35	31.72	14.79	31.66	14.93	31.59	15.07	31.52	15.21	35
36	32.63	15.21	32.56	15.36	32.49	15.50	32.43	15.64	36
37	33.53	15.64	33.46	15.78	33.40	15.93	33.33	16.07	37
38	34.44	16.06	34.37	16.21	34.30	16.36	34.23	16.51	38
39	35.35	16.48	35.27	16.64	35.20	16.79	35.13	16.94	39
40	36.25	16.90	36.18	17.06	36.10	17.22	36.03	17.38	40
41	37.16	17.33	37.08	17.49	37.01	17.65	36.93	17.81	41
42	38.06	17.75	37.99	17.92	37.91	18.08	37.83	18.25	42
43	38.97	18.17	38.89	18.34	38.81	18.51	38.73	18.68	43
44	39.88	18.60	39.80	18.77	39.71	18.94	39.63	19.12	44
45	40.78	19.02	40.70	19.20	40.62	19.37	40.53	19.55	45
46	41.69	19.44	41.60	19.62	41.52	19.80	41.43	19.98	46
47	42.60	19.86	42.51	20.05	42.42	20.23	42.33	20.42	47
48	43.50	20.29	43.41	20.48	43.32	20.66	43.23	20.85	48
49	44.41	20.71	44.32	20.90	44.23	21.10	44.13	21.29	49
50	45.32	21.13	45.22	21.33	45.13	21.53	45.03	21.72	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	65°.		64¾°.		64½°.		64¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	25°.		25¼°.		25½°.		25¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	46.22	21.55	46.13	21.76	46.03	21.96	45.94	22.16	51
52	47.13	21.98	47.03	22.18	46.93	22.39	46.84	22.59	52
53	48.03	22.40	47.94	22.61	47.84	22.82	47.74	23.03	53
54	48.94	22.82	48.84	23.03	48.74	23.25	48.64	23.46	54
55	49.85	23.24	49.75	23.46	49.64	23.68	49.54	23.89	55
56	50.75	23.67	50.65	23.89	50.54	24.11	50.44	24.33	56
57	51.66	24.09	51.55	24.31	51.45	24.54	51.34	24.76	57
58	52.57	24.51	52.46	24.74	52.35	24.97	52.24	25.20	58
59	53.47	24.93	53.36	25.17	53.25	25.40	53.14	25.63	59
60	54.38	25.36	54.27	25.59	54.16	25.83	54.04	26.07	60
61	55.28	25.78	55.17	26.02	55.06	26.26	54.94	26.50	61
62	56.19	26.20	56.08	26.45	55.96	26.69	55.84	26.94	62
63	57.10	26.62	56.98	26.87	56.86	27.12	56.74	27.37	63
64	58.00	27.05	57.89	27.30	57.77	27.55	57.64	27.80	64
65	58.91	27.47	58.79	27.73	58.67	27.98	58.55	28.24	65
66	59.82	27.89	59.69	28.15	59.57	28.41	59.45	28.67	66
67	60.72	28.32	60.60	28.58	60.47	28.84	60.35	29.11	67
68	61.63	28.74	61.50	29.01	61.38	29.27	61.25	29.54	68
69	62.54	29.16	62.41	29.43	62.28	29.71	62.15	29.98	69
70	63.44	29.58	63.31	29.86	63.18	30.14	63.05	30.41	70
71	64.35	30.01	64.22	30.29	64.08	30.57	63.95	30.85	71
72	65.25	30.43	65.12	30.71	64.99	31.00	64.85	31.28	72
73	66.16	30.85	66.03	31.14	65.89	31.43	65.75	31.71	73
74	67.07	31.27	66.93	31.57	66.79	31.86	66.65	32.15	74
75	67.97	31.70	67.83	31.99	67.69	32.29	67.55	32.58	75
76	68.88	32.12	68.74	32.42	68.60	32.72	68.45	33.02	76
77	69.79	32.54	69.64	32.85	69.50	33.15	69.35	33.45	77
78	70.69	32.96	70.55	33.27	70.40	33.58	70.25	33.89	78
79	71.60	33.39	71.45	33.70	71.30	34.01	71.16	34.32	79
80	72.50	33.81	72.36	34.13	72.21	34.44	72.06	34.76	80
81	73.41	34.23	73.26	34.55	73.11	34.87	72.96	35.19	81
82	74.32	34.65	74.17	34.98	74.01	35.30	73.86	35.62	82
83	75.22	35.08	75.07	35.41	74.91	35.73	74.76	36.06	83
84	76.13	35.50	75.97	35.83	75.82	36.16	75.66	36.49	84
85	77.04	35.92	76.88	36.26	76.72	36.59	76.56	36.93	85
86	77.94	36.35	77.78	36.68	77.62	37.02	77.46	37.36	86
87	78.85	36.77	78.69	37.11	78.52	37.45	78.36	37.80	87
88	79.76	37.19	79.59	37.54	79.43	37.88	79.26	38.23	88
89	80.66	37.61	80.50	37.96	80.33	38.32	80.16	38.67	89
90	81.57	38.04	81.40	38.39	81.23	38.75	81.06	39.10	90
91	82.47	38.46	82.31	38.82	82.14	39.18	81.96	39.53	91
92	83.38	38.88	83.21	39.24	83.04	39.61	82.86	39.97	92
93	84.29	39.30	84.11	39.67	83.94	40.04	83.76	40.40	93
94	85.19	39.73	85.02	40.10	84.84	40.47	84.67	40.84	94
95	86.10	40.15	85.92	40.52	85.75	40.90	85.57	41.27	95
96	87.01	40.57	86.83	40.95	86.65	41.33	86.47	41.71	96
97	87.91	40.99	87.73	41.38	87.55	41.76	87.37	42.14	97
98	88.82	41.42	88.64	41.80	88.45	42.19	88.27	42.58	98
99	89.72	41.84	89.54	42.23	89.36	42.62	89.17	43.01	99
100	90.63	42.26	90.45	42.66	90.26	43.05	90.07	43.44	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	65°.		64¾°.		64½°.		64¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	26°.		26¼°.		26½°.		26¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.90	0.44	0.90	0.44	0.89	0.45	0.89	0.45	1
2	1.80	0.88	1.79	0.88	1.79	0.89	1.79	0.90	2
3	2.70	1.32	2.69	1.33	2.68	1.34	2.68	1.35	3
4	3.60	1.75	3.59	1.77	3.58	1.78	3.57	1.80	4
5	4.49	2.19	4.48	2.21	4.47	2.23	4.46	2.25	5
6	5.39	2.63	5.38	2.65	5.37	2.68	5.36	2.70	6
7	6.29	3.07	6.28	3.10	6.26	3.12	6.25	3.15	7
8	7.19	3.51	7.17	3.54	7.16	3.57	7.14	3.60	8
9	8.09	3.95	8.07	3.98	8.05	4.02	8.04	4.05	9
10	8.99	4.38	8.97	4.42	8.95	4.46	8.93	4.50	10
11	9.89	4.82	9.87	4.87	9.84	4.91	9.82	4.95	11
12	10.79	5.26	10.76	5.31	10.74	5.35	10.72	5.40	12
13	11.68	5.70	11.66	5.75	11.63	5.80	11.61	5.85	13
14	12.58	6.14	12.56	6.19	12.53	6.25	12.50	6.30	14
15	13.48	6.58	13.45	6.63	13.42	6.69	13.39	6.75	15
16	14.38	7.01	14.35	7.08	14.32	7.14	14.29	7.20	16
17	15.28	7.45	15.25	7.52	15.21	7.59	15.18	7.65	17
18	16.18	7.89	16.14	7.96	16.11	8.03	16.07	8.10	18
19	17.08	8.33	17.04	8.40	17.00	8.48	16.97	8.55	19
20	17.98	8.77	17.94	8.85	17.90	8.92	17.86	9.00	20
21	18.87	9.21	18.83	9.29	18.79	9.37	18.75	9.45	21
22	19.77	9.64	19.73	9.73	19.69	9.82	19.65	9.90	22
23	20.67	10.08	20.63	10.17	20.58	10.26	20.54	10.35	23
24	21.57	10.52	21.52	10.61	21.48	10.71	21.43	10.80	24
25	22.47	10.96	22.42	11.06	22.37	11.15	22.32	11.25	25
26	23.37	11.40	23.32	11.50	23.27	11.60	23.22	11.70	26
27	24.27	11.84	24.22	11.94	24.16	12.05	24.11	12.15	27
28	25.17	12.27	25.11	12.38	25.06	12.49	25.00	12.60	28
29	26.07	12.71	26.01	12.83	25.95	12.94	25.90	13.05	29
30	26.96	13.15	26.91	13.27	26.85	13.39	26.79	13.50	30
31	27.86	13.59	27.80	13.71	27.74	13.83	27.68	13.95	31
32	28.76	14.03	28.70	14.15	28.64	14.28	28.58	14.40	32
33	29.66	14.47	29.60	14.60	29.53	14.72	29.47	14.85	33
34	30.56	14.90	30.49	15.04	30.43	15.17	30.36	15.30	34
35	31.46	15.34	31.39	15.48	31.32	15.62	31.25	15.75	35
36	32.36	15.78	32.29	15.92	32.22	16.06	32.15	16.20	36
37	33.26	16.22	33.18	16.36	33.11	16.51	33.04	16.65	37
38	34.15	16.66	34.08	16.81	34.01	16.96	33.93	17.10	38
39	35.05	17.10	34.98	17.25	34.90	17.40	34.83	17.55	39
40	35.95	17.53	35.87	17.69	35.80	17.85	35.72	18.00	40
41	36.85	17.97	36.77	18.13	36.69	18.29	36.61	18.45	41
42	37.75	18.41	37.67	18.58	37.59	18.74	37.51	18.90	42
43	38.65	18.85	38.57	19.02	38.48	19.19	38.40	19.35	43
44	39.55	19.29	39.46	19.46	39.38	19.63	39.29	19.80	44
45	40.45	19.73	40.36	19.90	40.27	20.08	40.18	20.25	45
46	41.34	20.17	41.26	20.35	41.17	20.53	41.08	20.70	46
47	42.24	20.60	42.15	20.79	42.06	20.97	41.97	21.15	47
48	43.14	21.04	43.05	21.23	42.96	21.42	42.86	21.60	48
49	44.04	21.48	43.95	21.67	43.85	21.86	43.76	22.05	49
50	44.94	21.92	44.84	22.11	44.75	22.31	44.65	22.50	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	64°.		63¾°.		63½°.		63¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	26°.		26¼°.		26½°.		26¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	45.84	22.36	45.74	22.56	45.64	22.76	45.54	22.96	51
52	46.74	22.80	46.64	23.00	46.54	23.20	46.43	23.41	52
53	47.64	23.23	47.53	23.44	47.43	23.65	47.33	23.86	53
54	48.53	23.67	48.43	23.88	48.33	24.09	48.22	24.31	54
55	49.43	24.11	49.33	24.33	49.22	24.54	49.11	24.76	55
56	50.33	24.55	50.22	24.77	50.12	24.99	50.01	25.21	56
57	51.23	24.99	51.12	25.21	51.01	25.43	50.90	25.66	57
58	52.13	25.43	52.02	25.65	51.91	25.88	51.79	26.11	58
59	53.03	25.86	52.92	26.10	52.80	26.33	52.69	26.56	59
60	53.93	26.30	53.81	26.54	53.70	26.77	53.58	27.01	60
61	54.83	26.74	54.71	26.98	54.59	27.22	54.47	27.46	61
62	55.73	27.18	55.61	27.42	55.49	27.66	55.36	27.91	62
63	56.62	27.62	56.50	27.86	56.38	28.11	56.26	28.36	63
64	57.52	28.06	57.40	28.31	57.28	28.56	57.15	28.81	64
65	58.42	28.49	58.30	28.75	58.17	29.00	58.04	29.26	65
66	59.32	28.93	59.19	29.19	59.07	29.45	58.94	29.71	66
67	60.22	29.37	60.09	29.63	59.96	29.90	59.83	30.16	67
68	61.12	29.81	60.99	30.08	60.86	30.34	60.72	30.61	68
69	62.02	30.25	61.88	30.52	61.75	30.79	61.62	31.06	69
70	62.92	30.69	62.78	30.96	62.65	31.23	62.51	31.51	70
71	63.81	31.12	63.68	31.40	63.54	31.68	63.40	31.96	71
72	64.71	31.56	64.57	31.84	64.44	32.13	64.29	32.41	72
73	65.61	32.00	65.47	32.29	65.33	32.57	65.19	32.86	73
74	66.51	32.44	66.37	32.73	66.23	33.02	66.08	33.31	74
75	67.41	32.88	67.27	33.17	67.12	33.46	66.97	33.76	75
76	68.31	33.32	68.16	33.61	68.01	33.91	67.87	34.21	76
77	69.21	33.75	69.06	34.06	68.91	34.36	68.76	34.66	77
78	70.11	34.19	69.96	34.50	69.80	34.80	69.65	35.11	78
79	71.00	34.63	70.85	34.94	70.70	35.25	70.55	35.56	79
80	71.90	35.07	71.75	35.38	71.59	35.70	71.44	36.01	80
81	72.80	35.51	72.65	35.83	72.49	36.14	72.33	36.46	81
82	73.70	35.95	73.54	36.27	73.38	36.59	73.22	36.91	82
83	74.60	36.38	74.44	36.71	74.28	37.03	74.12	37.36	83
84	75.50	36.82	75.34	37.15	75.17	37.48	75.01	37.81	84
85	76.40	37.26	76.23	37.59	76.07	37.93	75.90	38.26	85
86	77.30	37.70	77.13	38.04	76.96	38.37	76.80	38.71	86
87	78.20	38.14	78.03	38.48	77.86	38.82	77.69	39.16	87
88	79.09	38.58	78.92	38.92	78.75	39.27	78.58	39.61	88
89	79.99	39.02	79.82	39.36	79.65	39.71	79.48	40.06	89
90	80.89	39.45	80.72	39.81	80.54	40.16	80.37	40.51	90
91	81.79	39.89	81.62	40.25	81.44	40.60	81.26	40.96	91
92	82.69	40.33	82.51	40.69	82.33	41.05	82.15	41.41	92
93	83.59	40.77	83.41	41.13	83.23	41.50	83.05	41.86	93
94	84.49	41.21	84.31	41.58	84.12	41.94	83.94	42.31	94
95	85.39	41.65	85.20	42.02	85.02	42.39	84.83	42.76	95
96	86.28	42.08	86.10	42.46	85.91	42.83	85.73	43.21	96
97	87.18	42.52	87.00	42.90	86.81	43.28	86.62	43.66	97
98	88.08	42.96	87.89	43.34	87.70	43.73	87.51	44.11	98
99	88.98	43.40	88.79	43.79	88.60	44.17	88.40	44.56	99
100	89.88	43.84	89.69	44.23	89.49	44.62	89.30	45.01	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	64°.		63¾°.		63½°.		63¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	27°.		27¼°.		27½°.		27¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.89	0.45	0.89	0.46	0.89	0.46	0.88	0.47	1
2	1.78	0.91	1.78	0.92	1.77	0.92	1.77	0.93	2
3	2.67	1.36	2.67	1.37	2.66	1.39	2.65	1.40	3
4	3 56	1.82	3.56	1.83	3.55	1.85	3.54	1.86	4
5	4.46	2.27	4.45	2.29	4.44	2.31	4.42	2.33	5
6	5.35	2.72	5.33	2.75	5.32	2.77	5.31	2.79	6
7	6.24	3.18	6.22	3.21	6.21	3.23	6.19	3.26	7
8	7.13	3.63	7.11	3.66	7.10	3.69	7.08	3.72	8
9	8.02	4.09	8.00	4.12	7.98	4.16	7.96	4.19	9
10	8.91	4.54	8.89	4.58	8.87	4.62	8.85	4.66	10
11	9.80	4.99	9.78	5.04	9.76	5.08	9.73	5.12	11
12	10.69	5.45	10.67	5.49	10.64	5.54	10.62	5.59	12
13	11.58	5.90	11.56	5.95	11.53	6.00	11.50	6.05	13
14	12.47	6.36	12.45	6.41	12.42	6.46	12.39	6.52	14
15	13.37	6.81	13.34	6.87	13.31	6.93	13.27	6.98	15
16	14.26	7.26	14.22	7.33	14.19	7.39	14.16	7.45	16
17	15.15	7.72	15.11	7.78	15.08	7.85	15.04	7.92	17
18	16.04	8.17	16.00	8.24	15.97	8.31	15.93	8.38	18
19	16.93	8.63	16.89	8.70	16.85	8.77	16.81	8.85	19
20	17.82	9.08	17.78	9.16	17.74	9.23	17.70	9.31	20
21	18.71	9.53	18.67	9.62	18.63	9.70	18.58	9.78	21
22	19.60	9.99	19.56	10.07	19.51	10.16	19.47	10.24	22
23	20.49	10.44	20.45	10.53	20.40	10.62	20.35	10.71	23
24	21.38	10.90	21.34	10.99	21.29	11.08	21.24	11.17	24
25	22.28	11.35	22.23	11.45	22.18	11.54	22.12	11.64	25
26	23.17	11.80	23.11	11.90	23.06	12.01	23.01	12.11	26
27	24.06	12.26	24.00	12.36	23.95	12.47	23.89	12.57	27
28	24.95	12.71	24.89	12.82	24.84	12.93	24.78	13.04	28
29	25.84	13.17	25.78	13.28	25.72	13.39	25.66	13.50	29
30	26.73	13.62	26.67	13.74	26.61	13.85	26.55	13.97	30
31	27.62	14.07	27.56	14.19	27.50	14.31	27.43	14.43	31
32	28.51	14.53	28.45	14.65	28.38	14.78	28.32	14.90	32
33	29.40	14.98	29.34	15.11	29.27	15.24	29.20	15.37	33
34	30.29	15.44	30.23	15.57	30.16	15.70	30.09	15.83	34
35	31.19	15.89	31.12	16.03	31.05	16.16	30.97	16.30	35
36	32.08	16.34	32.00	16.48	31.93	16.62	31.86	16.76	36
37	32.97	16.80	32.89	16.94	32.82	17.08	32.74	17.23	37
38	33.86	17.25	33.78	17.40	33.71	17.55	33.63	17.69	38
39	34.75	17.71	34.67	17.86	34.59	18.01	34.51	18.16	39
40	35.64	18.16	35.56	18.31	35.48	18.47	35.40	18.62	40
41	36.53	18.61	36.45	18.77	36.37	18.93	36.28	19.09	41
42	37.42	19.07	37.34	19.23	37.25	19.39	37.17	19.56	42
43	38.31	19.52	38.23	19.69	38.14	19.86	38.05	20.02	43
44	39.20	19.98	39.12	20.15	39.03	20.32	38.94	20.49	44
45	40.10	20.43	40.01	20.60	39.92	20.78	39.82	20.95	45
46	40.99	20.88	40.89	21.06	40.80	21.24	40.71	21.42	46
47	41.88	21.34	41.78	21.52	41.69	21.70	41.59	21.88	47
48	42.77	21.79	42.67	21.98	42.58	22.16	42.48	22.35	48
49	43.66	22.25	43.56	22.44	43.46	22.63	43.36	22.82	49
50	44.55	22.70	44.45	22.89	44.35	23.09	44.25	23.28	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	63°.		62¾°.		62½°.		62¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	27°.		27¼°.		27½°.		27¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	45.44	23.15	45.34	23.35	45.24	23.55	45.13	23.75	51
52	46.33	23.61	46.23	23.81	46.12	24.01	46.02	24.21	52
53	47.22	24.06	47.12	24.27	47.01	24.47	46.90	24.68	53
54	48.11	24.52	48.01	24.73	47.90	24.93	47.79	25.14	54
55	49.01	24.97	48.90	25.18	48.79	25.40	48.67	25.61	55
56	49.90	25.42	49.78	25.64	49.67	25.86	49.56	26.07	56
57	50.79	25.88	50.67	26.10	50.56	26.32	50.44	26.54	57
58	51.68	26.33	51.56	26.56	51.45	26.78	51.33	27.01	58
59	52.57	26.79	52.45	27.01	52.33	27.24	52.21	27.47	59
60	53.46	27.24	53.34	27.47	53.22	27.70	53.10	27.94	60
61	54.35	27.69	54.23	27.93	54.11	28.17	53.98	28.40	61
62	55.24	28.15	55.12	28.39	54.99	28.63	54.87	28.87	62
63	56.13	28.60	56.01	28.85	55.88	29.09	55.75	29.33	63
64	57.02	29.06	56.90	29.30	56.77	29.55	56.64	29.80	64
65	57.92	29.51	57.79	29.76	57.66	30.01	57.52	30.26	65
66	58.81	29.96	58.68	30.22	58.54	30.48	58.41	30.73	66
67	59.70	30.42	59.56	30.68	59.43	30.94	59.29	31.20	67
68	60.59	30.87	60.45	31.14	60.32	31.40	60.18	31.66	68
69	61.48	31.33	61.34	31.59	61.20	31.86	61.06	32.13	69
70	62.37	31.78	62.23	32.05	62.09	32.32	61.95	32.59	70
71	63.26	32.23	63.12	32.51	62.98	32.78	62.83	33.06	71
72	64.15	32.69	64.01	32.97	63.86	33.25	63.72	33.52	72
73	65.04	33.14	64.90	33.42	64.75	33.71	64.60	33.99	73
74	65.93	33.60	65.79	33.88	65.64	34.17	65.49	34.46	74
75	66.83	34.05	66.68	34.34	66.53	34.63	66.37	34.92	75
76	67.72	34.50	67.57	34.80	67.41	35.09	67.26	35.39	76
77	68.61	34.96	68.45	35.26	68.30	35.55	68.14	35.85	77
78	69.50	35.41	69.34	35.71	69.19	36.02	69.03	36.32	78
79	70.39	35.87	70.23	36.17	70.07	36.48	69.91	36.78	79
80	71.28	36.32	71.12	36.63	70.96	36.94	70.80	37.25	80
81	72.17	36.77	72.01	37.09	71.85	37.40	71.68	37.71	81
82	73.06	37.23	72.90	37.55	72.73	37.86	72.57	38.18	82
83	73.95	37.68	73.79	38.00	73.62	38.33	73.45	38.65	83
84	74.84	38.14	74.68	38.46	74.51	38.79	74.34	39.11	84
85	75.74	38.59	75.57	38.92	75.40	39.25	75.22	39.58	85
86	76.63	39.04	76.46	39.38	76.28	39.71	76.11	40.04	86
87	77.52	39.50	77.34	39.84	77.17	40.17	76.99	40.51	87
88	78.41	39.95	78.23	40.29	78.06	40.63	77.88	40.97	88
89	79.30	40.41	79.12	40.75	78.94	41.10	78.76	41.44	89
90	80.19	40.86	80.01	41.21	79.83	41.56	79.65	41.91	90
91	81.08	41.31	80.90	41.67	80.72	42.02	80.53	42.37	91
92	81.97	41.77	81.79	42.12	81.60	42.48	81.42	42.84	92
93	82.86	42.22	82.68	42.58	82.49	42.94	82.30	43.30	93
94	83.75	42.68	83.57	43.04	83.38	43.40	83.19	43.77	94
95	84.65	43.13	84.46	43.50	84.27	43.87	84.07	44.23	95
96	85.54	43.58	85.35	43.96	85.15	44.33	84.96	44.70	96
97	86.43	44.04	86.23	44.41	86.04	44.79	85.84	45.16	97
98	87.32	44.49	87.12	44.87	86.93	45.25	86.73	45.63	98
99	88.21	44.95	88.01	45.33	87.81	45.71	87.61	46.10	99
100	89.10	45.40	88.90	45.79	88.70	46.17	88.50	46.56	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	63°.		62¾°.		62½°.		62¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	28°.		28¼°.		28½°.		28¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.88	0.47	0.88	0.47	0.88	0.48	0.88	0.48	1
2	1.77	0.94	1.76	0.95	1.76	0.95	1.75	0.96	2
3	2.65	1.41	2.64	1.42	2.64	1.43	2.63	1.44	3
4	3.53	1.88	3.52	1.89	3.52	1.91	3.51	1.92	4
5	4.41	2.35	4.40	2.37	4.39	2.39	4.38	2.40	5
6	5.30	2.82	5.29	2.84	5.27	2.86	5.26	2.89	6
7	6.18	3.29	6.17	3.31	6.15	3.34	6.14	3.37	7
8	7.06	3.76	7.05	3.79	7.03	3.82	7.01	3.85	8
9	7.95	4.23	7.93	4.26	7.91	4.29	7.89	4.33	9
10	8.83	4.69	8.81	4.73	8.79	4.77	8.77	4.81	10
11	9.71	5.16	9.69	5.21	9.67	5.25	9.64	5.29	11
12	10.60	5.63	10.57	5.68	10.55	5.73	10.52	5.77	12
13	11.48	6.10	11.45	6.15	11.42	6.20	11.40	6.25	13
14	12.36	6.57	12.33	6.63	12.30	6.68	12.27	6.73	14
15	13.24	7.04	13.21	7.10	13.18	7.16	13.15	7.21	15
16	14.13	7.51	14.09	7.57	14.06	7.63	14.03	7.70	16
17	15.01	7.98	14.98	8.05	14.94	8.11	14.90	8.18	17
18	15.89	8.45	15.86	8.52	15.82	8.59	15.78	8.66	18
19	16.78	8.92	16.74	8.99	16.70	9.07	16.66	9.14	19
20	17.66	9.39	17.62	9.47	17.58	9.54	17.53	9.62	20
21	18.54	9.86	18.50	9.94	18.46	10.02	18.41	10.10	21
22	19.42	10.33	19.38	10.41	19.33	10.50	19.29	10.58	22
23	20.31	10.80	20.26	10.89	20.21	10.97	20.16	11.06	23
24	21.19	11.27	21.14	11.36	21.09	11.45	21.04	11.54	24
25	22.07	11.74	22.02	11.83	21.97	11.93	21.92	12.02	25
26	22.96	12.21	22.90	12.31	22.85	12.41	22.79	12.51	26
27	23.84	12.68	23.78	12.78	23.73	12.88	23.67	12.99	27
28	24.72	13.15	24.66	13.25	24.61	13.36	24.55	13.47	28
29	25.61	13.61	25.55	13.73	25.49	13.84	25.43	13.95	29
30	26.49	14.08	26.43	14.20	26.36	14.31	26.30	14.43	30
31	27.37	14.55	27.31	14.67	27.24	14.79	27.18	14.91	31
32	28.25	15.02	28.19	15.15	28.12	15.27	28.06	15.39	32
33	29.14	15.49	29.07	15.62	29.00	15.75	28.93	15.87	33
34	30.02	15.96	29.95	16.09	29.88	16.22	29.81	16.35	34
35	30.90	16.43	30.83	16.57	30.76	16.70	30.69	16.83	35
36	31.79	16.90	31.71	17.04	31.64	17.18	31.56	17.32	36
37	32.67	17.37	32.59	17.51	32.52	17.65	32.44	17.80	37
38	33.55	17.84	33.47	17.99	33.40	18.13	33.32	18.28	38
39	34.43	18.31	34.35	18.46	34.27	18.61	34.19	18.76	39
40	35.32	18.78	35.24	18.93	35.15	19.09	35.07	19.24	40
41	36.20	19.25	36.12	19.41	36.03	19.56	35.95	19.72	41
42	37.08	19.72	37.00	19.88	36.91	20.04	36.82	20.20	42
43	37.97	20.19	37.88	20.35	37.79	20.52	37.70	20.68	43
44	38.85	20.66	38.76	20.83	38.67	20.99	38.58	21.16	44
45	39.73	21.13	39.64	21.30	39.55	21.47	39.45	21.64	45
46	40.62	21.60	40.52	21.77	40.43	21.95	40.33	22.13	46
47	41.50	22.07	41.40	22.25	41.30	22.43	41.21	22.61	47
48	42.38	22.53	42.28	22.72	42.18	22.90	42.08	23.09	48
49	43.26	23.00	43.15	23.19	43.06	23.38	42.96	23.57	49
50	44.15	23.47	44.04	23.67	43.94	23.86	43.84	24.05	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	62°.		61¾°.		61½°.		61¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	28°.		28¼°.		28½°.		28¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	45.03	23.94	44.93	24.14	44.82	24.34	44.71	24.53	51
52	45.91	24.41	45.81	24.61	45.70	24.81	45.59	25.01	52
53	46.80	24.88	46.69	25.09	46.58	25.29	46.47	25.49	53
54	47.68	25.35	47.57	25.56	47.46	25.77	47.34	25.97	54
55	48.56	25.82	48.45	26.03	48.33	26.24	48.22	26.45	55
56	49.45	26.29	49.33	26.51	49.21	26.72	49.10	26.94	56
57	50.33	26.76	50.21	26.98	50.09	27.20	49.97	27.42	57
58	51.21	27.23	51.09	27.45	50.97	27.68	50.85	27.90	58
59	52.09	27.70	51.97	27.93	51.85	28.15	51.73	28.38	59
60	52.98	28.17	52.85	28.40	52.73	28.63	52.60	28.86	60
61	53.86	28.64	53.73	28.87	53.61	29.11	53.48	29.34	61
62	54.74	29.11	54.62	29.35	54.49	29.58	54.36	29.82	62
63	55.63	29.58	55.50	29.82	55.37	30.06	55.23	30.30	63
64	56.51	30.05	56.38	30.29	56.24	30.54	56.11	30.78	64
65	57.39	30.52	57.26	30.77	57.12	31.02	56.99	31.26	65
66	58.27	30.99	58.14	31.24	58.00	31.49	57.86	31.75	66
67	59.16	31.45	59.02	31.71	58.88	31.97	58.74	32.23	67
68	60.04	31.92	59.90	32.19	59.76	32.45	59.62	32.71	68
69	60.92	32.39	60.78	32.66	60.64	32.92	60.49	33.19	69
70	61.81	32.86	61.66	33.13	61.52	33.40	61.37	33.67	70
71	62.69	33.33	62.54	33.61	62.40	33.88	62.25	34.15	71
72	63.57	33.80	63.42	34.08	63.27	34.36	63.12	34.63	72
73	64.46	34.27	64.31	34.55	64.15	34.83	64.00	35.11	73
74	65.34	34.74	65.19	35.03	65.03	35.31	64.88	35.59	74
75	66.22	35.21	66.07	35.50	65.91	35.79	65.75	36.07	75
76	67.10	35.68	66.95	35.97	66.79	36.26	66.63	36.56	76
77	67.99	36.15	67.83	36.45	67.67	36.74	67.51	37.04	77
78	68.87	36.62	68.71	36.92	68.55	37.22	68.38	37.52	78
79	69.75	37.09	69.59	37.39	69.43	37.70	69.26	38.00	79
80	70.64	37.56	70.47	37.87	70.31	38.17	70.14	38.48	80
81	71.52	38.03	71.35	38.34	71.18	38.65	71.01	38.96	81
82	72.40	38.50	72.23	38.81	72.06	39.13	71.89	39.44	82
83	73.28	38.97	73.11	39.29	72.94	39.60	72.77	39.92	83
84	74.17	39.44	73.99	39.76	73.82	40.08	73.65	40.40	84
85	75.05	39.91	74.88	40.23	74.70	40.56	74.52	40.88	85
86	75.93	40.37	75.76	40.71	75.58	41.04	75.40	41.37	86
87	76.82	40.84	76.64	41.18	76.46	41.51	76.28	41.85	87
88	77.70	41.31	77.52	41.65	77.34	41.99	77.15	42.33	88
89	78.58	41.78	78.40	42.13	78.21	42.47	78.03	42.81	89
90	79.47	42.25	79.28	42.60	79.09	42.94	78.91	43.29	90
91	80.35	42.72	80.16	43.07	79.97	43.42	79.78	43.77	91
92	81.23	43.19	81.04	43.55	80.85	43.90	80.66	44.25	92
93	82.11	43.66	81.92	44.02	81.73	44.38	81.54	44.73	93
94	83.00	44.13	82.80	44.49	82.61	44.85	82.41	45.21	94
95	83.88	44.60	83.68	44.97	83.49	45.33	83.29	45.69	95
96	84.76	45.07	84.57	45.44	84.37	45.81	84.17	46.17	96
97	85.65	45.54	85.45	45.91	85.25	46.28	85.04	46.66	97
98	86.53	46.01	86.33	46.39	86.12	46.76	85.92	47.14	98
99	87.41	46.48	87.21	46.86	87.00	47.24	86.80	47.62	99
100	88.29	46.95	88.09	47.33	87.88	47.72	87.67	48.10	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	62°.		61¾°.		61½°.		61¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	29°.		29¼°.		29½°.		29¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.87	0.48	0.87	0.49	0.87	0.49	0.87	0.50	1
2	1.75	0.97	1.74	0.98	1.74	0.98	1.74	0.99	2
3	2.62	1.45	2.62	1.47	2.61	1.48	2.60	1.49	3
4	3.50	1.94	3.49	1.95	3.48	1.97	3.47	1.98	4
5	4.37	2.42	4.36	2.44	4.35	2.46	4.34	2.48	5
6	5.25	2.91	5.23	2.93	5.22	2.95	5.21	2.98	6
7	6.12	3.39	6.11	3.42	6.09	3.45	6.08	3.47	7
8	7.00	3.88	6.98	3.91	6.96	3.94	6.95	3.97	8
9	7.87	4.36	7.85	4.40	7.83	4.43	7.81	4.47	9
10	8.75	4.85	8.72	4.89	8.70	4.92	8.68	4.96	10
11	9.62	5.33	9.60	5.37	9.57	5.42	9.55	5.46	11
12	10.50	5.82	10.47	5.86	10.44	5.91	10.42	5.95	12
13	11.37	6.30	11.34	6.35	11.31	6.40	11.29	6.45	13
14	12.24	6.79	12.21	6.84	12.18	6.89	12.15	6.95	14
15	13.12	7.27	13.09	7.33	13.06	7.39	13.02	7.44	15
16	13.99	7.76	13.96	7.82	13.93	7.88	13.89	7.94	16
17	14.87	8.24	14.83	8.31	14.80	8.37	14.76	8.44	17
18	15.74	8.73	15.70	8.80	15.67	8.86	15.63	8.93	18
19	16.62	9.21	16.58	9.28	16.54	9.36	16.50	9.43	19
20	17.49	9.70	17.45	9.77	17.41	9.85	17.36	9.92	20
21	18.37	10.18	18.32	10.26	18.28	10.34	18.23	10.42	21
22	19.24	10.67	19.19	10.75	19.15	10.83	19.10	10.92	22
23	20.12	11.15	20.07	11.24	20.02	11.33	19.97	11.41	23
24	20.99	11.64	20.94	11.73	20.89	11.82	20.84	11.91	24
25	21.87	12.12	21.81	12.22	21.76	12.31	21.70	12.41	25
26	22.74	12.61	22.68	12.70	22.63	12.80	22.57	12.90	26
27	23.61	13.09	23.56	13.19	23.50	13.30	23.44	13.40	27
28	24.49	13.57	24.43	13.68	24.37	13.79	24.31	13.89	28
29	25.36	14.06	25.30	14.17	25.24	14.28	25.18	14.39	29
30	26.24	14.54	26.17	14.66	26.11	14.77	26.05	14.89	30
31	27.11	15.03	27.05	15.15	26.98	15.27	26.91	15.38	31
32	27.99	15.51	27.92	15.64	27.85	15.76	27.78	15.88	32
33	28.86	16.00	28.79	16.12	28.72	16.25	28.65	16.38	33
34	29.74	16.48	29.66	16.61	29.59	16.74	29.52	16.87	34
35	30.61	16.97	30.54	17.10	30.46	17.23	30.39	17.37	35
36	31.49	17.45	31.41	17.59	31.33	17.73	31.26	17.86	36
37	32.36	17.94	32.28	18.08	32.20	18.22	32.12	18.36	37
38	33.24	18.42	33.15	18.57	33.07	18.71	32.99	18.86	38
39	34.11	18.91	34.03	19.06	33.94	19.20	33.86	19.35	39
40	34.98	19.39	34.90	19.54	34.81	19.70	34.73	19.85	40
41	35.86	19.88	35.77	20.03	35.68	20.19	35.60	20.34	41
42	36.73	20.36	36.64	20.52	36.55	20.68	36.46	20.84	42
43	37.61	20.85	37.52	21.01	37.43	21.17	37.33	21.34	43
44	38.48	21.33	38.39	21.50	38.30	21.67	38.20	21.83	44
45	39.36	21.82	39.26	21.99	39.17	22.16	39.07	22.33	45
46	40.23	22.30	40.13	22.48	40.04	22.65	39.94	22.83	46
47	41.11	22.79	41.01	22.97	40.91	23.14	40.81	23.32	47
48	41.98	23.27	41.88	23.45	41.78	23.64	41.67	23.82	48
49	42.86	23.76	42.75	23.94	42.65	24.13	42.54	24.31	49
50	43.73	24.24	43.62	24.43	43.52	24.62	43.41	24.81	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	61°.		60¾°.		60½°.		60¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	29°.		29¼°.		29½°.		29¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	44.61	24.73	44.50	24.92	44.39	25.11	44.28	25.31	51
52	45.48	25.21	45.37	25.41	45.26	25.61	45.15	25.80	52
53	46.35	25.69	46.24	25.90	46.13	26.10	46.01	26.30	53
54	47.23	26.18	47.11	26.39	47.00	26.59	46.88	26.80	54
55	48.10	26.66	47.99	26.87	47.87	27.08	47.75	27.29	55
56	48.98	27.15	48.86	27.36	48.74	27.58	48.62	27.79	56
57	49.85	27.63	49.73	27.85	49.61	28.07	49.49	28.28	57
58	50.73	28.12	50.60	28.34	50.48	28.56	50.36	28.78	58
59	51.60	28.60	51.48	28.83	51.35	29.05	51.22	29.28	59
60	52.48	29.09	52.35	29.32	52.22	29.55	52.09	29.77	60
61	53.35	29.57	53.22	29.81	53.09	30.04	52.96	30.27	61
62	54.23	30.06	54.09	30.29	53.96	30.53	53.83	30.77	62
63	55.10	30.54	54.97	30.78	54.83	31.02	54.70	31.26	63
64	55.98	31.03	55.84	31.27	55.70	31.52	55.56	31.76	64
65	56.85	31.51	56.71	31.76	56.57	32.01	56.43	32.25	65
66	57.72	32.00	57.58	32.25	57.44	32.50	57.30	32.75	66
67	58.60	32.48	58.46	32.74	58.31	32.99	58.17	33.25	67
68	59.47	32.97	59.33	33.23	59.18	33.48	59.04	33.74	68
69	60.35	33.45	60.20	33.71	60.05	33.98	59.91	34.24	69
70	61.22	33.94	61.07	34.20	60.92	34.47	60.77	34.74	70
71	62.10	34.42	61.95	34.69	61.80	34.96	61.64	35.23	71
72	62.97	34.91	62.82	35.18	62.67	35.45	62.51	35.73	72
73	63.85	35.39	63.69	35.67	63.54	35.95	63.38	36.22	73
74	64.72	35.88	64.56	36.16	64.41	36.44	64.25	36.72	74
75	65.60	36.36	65.44	36.65	65.28	36.93	65.11	37.22	75
76	66.47	36.85	66.31	37.14	66.15	37.42	65.98	37.71	76
77	67.35	37.33	67.18	37.62	67.02	37.92	66.85	38.21	77
78	68.22	37.82	68.05	38.11	67.89	38.41	67.72	38.70	78
79	69.09	38.30	68.93	38.60	68.76	38.90	68.59	39.20	79
80	69.97	38.78	69.80	39.09	69.63	39.39	69.46	39.70	80
81	70.84	39.27	70.67	39.58	70.50	39.89	70.32	40.19	81
82	71.72	39.75	71.54	40.07	71.37	40.38	71.19	40.69	82
83	72.59	40.24	72.42	40.56	72.24	40.87	72.06	41.19	83
84	73.47	40.72	73.29	41.04	73.11	41.36	72.93	41.68	84
85	74.34	41.21	74.16	41.53	73.98	41.86	73.80	42.18	85
86	75.22	41.69	75.03	42.02	74.85	42.35	74.67	42.67	86
87	76.09	42.18	75.91	42.51	75.72	42.84	75.53	43.17	87
88	76.97	42.66	76.78	43.00	76.59	43.33	76.40	43.67	88
89	77.84	43.15	77.65	43.49	77.46	43.83	77.27	44.16	89
90	78.72	43.63	78.52	43.98	78.33	44.32	78.14	44.66	90
91	79.59	44.12	79.40	44.46	79.20	44.81	79.01	45.16	91
92	80.47	44.60	80.27	44.95	80.07	45.30	79.87	45 65	92
93	81.34	45.09	81.14	45.44	80.94	45.80	80.74	46.15	93
94	82.21	45.57	82.01	45.93	81.81	46.29	81.61	46.64	94
95	83.09	46.06	82.89	46.42	82.68	46.78	82.48	47.14	95
96	83.96	46.54	83.76	46.91	83.55	47.27	83.35	47.64	96
97	84.84	47.03	84.63	47.40	84.42	47.77	84.22	48.13	97
98	85.71	47.51	85.50	47.88	85.29	48.26	85.08	48.63	98
99	86.59	48.00	86.38	48.37	86.17	48.75	85.95	49.13	99
100	87.46	48.48	87.25	48.86	87.04	49.24	86.82	49.62	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	61°.		60¾°.		60½°.		60¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	30°.		30¼°.		30½°.		30¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.87	0.50	0.86	0.50	0.86	0.51	0.86	0.51	1
2	1.73	1.00	1.73	1.01	1.72	1.02	1.72	1.02	2
3	2.60	1.50	2.59	1.51	2.58	1.52	2.58	1.53	3
4	3.46	2.00	3.46	2.02	3.45	2.03	3.44	2.05	4
5	4.33	2.50	4.32	2.52	4.31	2.54	4.30	2.56	5
6	5.20	3.00	5.18	3.02	5.17	3.05	5.16	3.07	6
7	6.06	3.50	6.05	3.53	6.03	3.55	6.02	3.58	7
8	6.93	4.00	6.91	4.03	6.89	4.06	6.88	4.09	8
9	7.79	4.50	7.77	4.53	7.75	4.57	7.73	4.60	9
10	8.66	5.00	8.64	5.04	8.62	5.08	8.59	5.11	10
11	9.53	5.50	9.50	5.54	9.48	5.58	9.45	5.62	11
12	10.39	6.00	10.37	6.05	10.34	6.09	10.31	6.14	12
13	11.26	6.50	11.23	6.55	11.20	6.60	11.17	6.65	13
14	12.12	7.00	12.09	7.05	12.06	7.11	12.03	7.16	14
15	12.99	7.50	12.96	7.56	12.92	7.61	12.89	7.67	15
16	13.86	8.00	13.82	8.06	13.79	8.12	13.75	8.18	16
17	14.72	8.50	14.69	8.56	14.65	8.63	14.61	8.69	17
18	15.59	9.00	15.55	9.07	15.51	9.14	15.47	9.20	18
19	16.45	9.50	16.41	9.57	16.37	9.64	16.33	9.71	19
20	17.32	10.00	17.28	10.08	17.23	10.15	17.19	10.23	20
21	18.19	10.50	18.14	10.58	18.09	10.66	18.05	10.74	21
22	19.05	11.00	19.00	11.08	18.96	11.17	18.91	11.25	22
23	19.92	11.50	19.87	11.59	19.82	11.67	19.77	11.76	23
24	20.78	12.00	20.73	12.09	20.68	12.18	20.63	12.27	24
25	21.65	12.50	21.60	12.59	21.54	12.69	21.49	12.78	25
26	22.52	13.00	22.46	13.10	22.40	13.20	22.34	13.29	26
27	23.38	13.50	23.32	13.60	23.26	13.70	23.20	13.80	27
28	24.25	14.00	24.19	14.11	24.13	14.21	24.06	14.32	28
29	25.11	14.50	25.05	14.61	24.99	14.72	24.92	14.83	29
30	25.98	15.00	25.92	15.11	25.85	15.23	25.78	15.34	30
31	26.85	15.50	26.78	15.62	26.71	15.73	26.64	15.85	31
32	27.71	16.00	27.64	16.12	27.57	16.24	27.50	16.36	32
33	28.58	16.50	28.51	16.62	28.43	16.75	28.36	16.87	33
34	29.44	17.00	29.37	17.13	29.30	17.26	29.22	17.38	34
35	30.31	17.50	30.23	17.63	30.16	17.76	30.08	17.90	35
36	31.18	18.00	31.10	18.14	31.02	18.27	30.94	18.41	36
37	32.04	18.50	31.96	18.64	31.88	18.78	31.80	18.92	37
38	32.91	19.00	32.83	19.14	32.74	19.29	32.66	19.43	38
39	33.77	19.50	33.69	19.65	33.60	19.79	33.52	19.94	39
40	34.64	20.00	34.55	20.15	34.47	20.30	34.38	20.45	40
41	35.51	20.50	35.42	20.65	35.33	20.81	35.24	20.96	41
42	36.37	21.00	36.28	21.16	36.19	21.32	36.10	21.47	42
43	37.24	21.50	37.14	21.66	37.05	21.82	36.95	21.99	43
44	38.11	22.00	38.01	22.17	37.91	22.33	37.81	22.50	44
45	38.97	22.50	38.87	22.67	38.77	22.84	38.67	23.01	45
46	39.84	23.00	39.74	23.17	39.63	23.35	39.53	23.52	46
47	40.70	23.50	40.60	23.68	40.50	23.85	40.39	24.03	47
48	41.57	24.00	41.46	24.18	41.36	24.36	41.25	24.54	48
49	42.44	24.50	42.33	24.68	42.22	24.87	42.11	25.05	49
50	43.30	25.00	43.19	25.19	43.08	25.38	42.97	25.56	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	60°.		59¾°.		59½°.		59¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	30°.		30¼°.		30½°.		30¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	44.17	25.50	44.06	25.69	43.94	25.88	43.83	26.08	51
52	45.03	26.00	44.92	26.20	44.80	26.39	44.69	26.59	52
53	45.90	26.50	45.78	26.70	45.67	26.90	45.55	27.10	53
54	46.77	27.00	46.65	27.20	46.53	27.41	46.41	27.61	54
55	47.63	27.50	47.51	27.71	47.39	27.91	47.27	28.12	55
56	48.50	28.00	48.37	28.21	48.25	28.42	48.13	28.63	56
57	49.36	28.50	49.24	28.72	49.11	28.93	48.99	29.14	57
58	50.23	29.00	50.10	29.22	49.97	29.44	49.85	29.65	58
59	51.10	29.50	50.97	29.72	50.84	29.94	50.70	30.17	59
60	51.96	30.00	51.83	30.23	51.70	30.45	51.56	30.68	60
61	52.83	30.50	52.69	30.73	52.56	30.96	52.42	31.19	61
62	53.69	31.00	53.56	31.23	53.42	31.47	53.28	31.70	62
63	54.56	31.50	54.42	31.74	54.28	31.97	54.14	32.21	63
64	55.43	32.00	55.29	32.24	55.14	32.48	55.00	32.72	64
65	56.29	32.50	56.15	32.75	56.01	32.99	55.86	33.23	65
66	57.16	33.00	57.01	33.25	56.87	33.50	56.72	33.75	66
67	58.02	33.50	57.88	33.75	57.73	34.01	57.58	34.26	67
68	58.89	34.00	58.74	34.26	58.59	34.51	58.44	34.77	68
69	59.76	34.50	59.60	34.76	59.45	35.02	59.30	35.28	69
70	60.62	35.00	60.47	35.26	60.31	35.53	60.16	35.79	70
71	61.49	35.50	61.33	35.77	61.18	36.04	61.02	36.30	71
72	62.35	36.00	62.20	36.27	62.04	36.54	61.88	36.81	72
73	63.22	36.50	63.06	36.78	62.90	37.05	62.74	37.32	73
74	64.09	37.00	63.92	37.28	63.76	37.56	63.60	37.84	74
75	64.95	37.50	64.79	37.78	64.62	38.07	64.46	38.35	75
76	65.82	38.00	65.65	38.29	65.48	38.57	65.31	38.86	76
77	66.68	38.50	66.52	38.79	66.35	39.08	66.17	39.37	77
78	67.55	39.00	67.38	39.29	67.21	39.59	67.03	39.88	78
79	68.42	39.50	68.24	39.80	68.07	40.10	67.89	40.39	79
80	69.28	40.00	69.11	40.30	68.93	40.60	68.75	40.90	80
81	70.15	40.50	69.97	40.81	69.79	41.11	69.61	41.41	81
82	71.01	41.00	70.83	41.31	70.65	41.62	70.47	41.93	82
83	71.88	41.50	71.70	41.81	71.52	42.13	71.33	42.44	83
84	72.75	42.00	72.56	42.32	72.38	42.63	72.19	42.95	84
85	73.61	42.50	73.43	42.82	73.24	43.14	73.05	43.46	85
86	74.48	43.00	74.29	43.32	74.10	43.65	73.91	43.97	86
87	75.34	43.50	75.15	43.83	74.96	44.16	74.77	44.48	87
88	76.21	44.00	76.02	44.33	75.82	44.66	75.63	44.99	88
89	77.08	44.50	76.88	44.84	76.68	45.17	76.49	45.51	89
90	77.94	45.00	77.75	45.34	77.55	45.68	77.35	46.02	90
91	78.81	45.50	78.61	45.84	78.41	46.19	78.21	46.53	91
92	79.67	46.00	79.47	46.35	79.27	46.69	79.07	47.04	92
93	80.54	46.50	80.34	46.85	80.13	47.20	79.92	47.55	93
94	81.41	47.00	81.20	47.35	80.99	47.71	80.78	48.06	94
95	82.27	47.50	82.06	47.86	81.85	48.22	81.64	48.57	95
96	83.14	48.00	82.93	48.36	82.72	48.72	82.50	49.08	96
97	84.00	48.50	83.79	48.87	83.58	49.23	83.36	49.60	97
98	84.87	49.00	84.66	49.37	84.44	49.74	84.22	50.11	98
99	85.74	49.50	85.52	49.87	85.30	50.25	85.08	50.62	99
100	86.60	50.00	86.38	50.38	86.16	50.75	85.94	51.13	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	60°.		59¾°.		59½°.		59¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	31°.		31¼°.		31½°.		31¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.86	0.52	0.85	0.52	0.85	0.52	0.85	0.53	1
2	1.71	1.03	1.71	1.04	1.71	1.04	1.70	1.05	2
3	2.57	1.55	2.56	1.56	2.56	1.57	2.55	1.58	3
4	3.43	2.06	3.42	2.08	3.41	2.09	3.40	2.10	4
5	4.29	2.58	4.27	2.59	4.26	2.61	4.25	2.63	5
6	5.14	3.09	5.13	3.11	5.12	3.13	5.10	3.16	6
7	6.00	3.61	5.98	3.63	5.97	3.66	5.95	3.68	7
8	6.86	4.12	6.84	4.15	6.82	4.18	6.80	4.21	8
9	7.71	4.64	7.69	4.67	7.67	4.70	7.65	4.74	9
10	8.57	5.15	8.55	5.19	8.53	5.22	8.50	5.26	10
11	9.43	5.67	9.40	5.71	9.38	5.75	9.35	5.79	11
12	10.29	6.18	10.26	6.23	10.23	6.27	10.20	6.31	12
13	11.14	6.70	11.11	6.74	11.08	6.79	11.05	6.84	13
14	12.00	7.21	11.97	7.26	11.94	7.31	11.90	7.37	14
15	12.86	7.73	12.82	7.78	12.79	7.84	12.76	7.89	15
16	13.71	8.24	13.68	8.30	13.64	8.36	13.61	8.42	16
17	14.57	8.76	14.53	8.82	14.49	8.88	14.46	8.95	17
18	15.43	9.27	15.39	9.34	15.35	9.40	15.31	9.47	18
19	16.29	9.79	16.24	9.86	16.20	9.93	16.16	10.00	19
20	17.14	10.30	17.10	10.38	17.05	10.45	17.01	10.52	20
21	18.00	10.82	17.95	10.89	17.91	10.97	17.86	11.05	21
22	18.86	11.33	18.81	11.41	18.76	11.49	18.71	11.58	22
23	19.71	11.85	19.66	11.93	19.61	12.02	19.56	12.10	23
24	20.57	12.36	20.52	12.45	20.46	12.54	20.41	12.63	24
25	21.43	12.88	21.37	12.97	21.32	13.06	21.26	13.16	25
26	22.29	13.39	22.23	13.49	22.17	13.58	22.11	13.68	26
27	23.14	13.91	23.08	14.01	23.02	14.11	22.96	14.21	27
28	24.00	14.42	23.94	14.53	23.87	14.63	23.81	14.73	28
29	24.86	14.94	24.79	15.04	24.73	15.15	24.66	15.26	29
30	25.72	15.45	25.65	15.56	25.58	15.67	25.51	15.79	30
31	26.57	15.97	26.50	16.08	26.43	16.20	26.36	16.31	31
32	27.43	16.48	27.36	16.60	27.28	16.72	27.21	16.84	32
33	28.29	17.00	28.21	17.12	28.14	17.24	28.06	17.37	33
34	29.14	17.51	29.07	17.64	28.99	17.76	28.91	17.89	34
35	30.00	18.03	29.92	18.16	29.84	18.29	29.76	18.42	35
36	30.86	18.54	30.78	18.68	30.70	18.81	30.61	18.94	36
37	31.72	19.06	31.63	19.19	31.55	19.33	31.46	19.47	37
38	32.57	19.57	32.49	19.71	32.40	19.85	32.31	20.00	38
39	33.43	20.09	33.34	20.23	33.25	20.38	33.16	20.52	39
40	34.29	20.60	34.20	20.75	34.11	20.90	34.01	21.05	40
41	35.14	21.12	35.05	21 27	34.96	21.42	34.86	21.57	41
42	36.00	21.63	35.91	21.79	35.81	21.94	35.71	22.10	42
43	36.86	22.15	36.76	22.31	36.66	22.47	36.57	22.63	43
44	37.72	22.66	37.62	22.83	37.52	22.99	37.42	23.15	44
45	38.57	23.18	38.47	23.34	38.37	23.51	38.27	23.68	45
46	39.43	23.69	39.33	23.86	39.22	24.03	39.12	24.21	46
47	40.29	24.21	40.18	24.38	40.07	24.56	39.97	24.73	47
48	41.14	24.72	41.04	24.90	40.93	25.08	40.82	25.26	48
49	42.00	25.24	41.89	25.42	41.78	25.60	41.67	25.78	49
50	42.86	25.75	42.75	25.94	42.63	26.12	42.52	26.31	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	59°.		58¾°.		58½°.		58¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	31°.		31¼°.		31½°.		31¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	43.72	26.27	43.60	26.46	43.48	26.65	43.37	26.84	51
52	44.57	26.78	44.46	26.98	44.34	27.17	44.22	27.36	52
53	45.43	27.30	45.31	27.49	45.19	27.69	45.07	27.89	53
54	46.29	27.81	46.17	28.01	46.04	28.21	45.92	28.42	54
55	47.14	28.33	47.02	28.53	46.90	28.74	46.77	28.94	55
56	48.00	28.84	47.88	29.05	47.75	29.26	47.62	29.47	56
57	48.86	29.36	48.73	29.57	48.60	29.78	48.47	29.99	57
58	49.72	29.87	49.58	30.09	49.45	30.30	49.32	30.52	58
59	50.57	30.39	50.44	30.61	50.31	30.83	50.17	31.05	59
60	51.43	30.90	51.29	31.13	51.16	31.35	51.02	31.57	60
61	52.29	31.42	52.15	31.65	52.01	31.87	51.87	32.10	61
62	53.14	31.93	53.00	32.16	52.86	32.39	52.72	32.63	62
63	54.00	32.45	53.86	32.68	53.72	32.92	53.57	33.15	63
64	54.86	32.96	54.71	33.20	54.57	33.44	54.42	33.68	64
65	55.72	33.48	55.57	33.72	55.42	33.96	55.27	34.20	65
66	56.57	33.99	56.42	34.24	56.27	34.48	56.12	34.73	66
67	57.43	34.51	57.28	34.76	57.13	35.01	56.98	35.26	67
68	58.29	35.02	58.13	35.28	57.98	35.53	57.82	35.78	68
69	59.14	35.54	58.99	35.80	58.83	36.05	58.67	36.31	69
70	60.00	36.05	59.84	36.31	59.68	36.57	59.52	36.83	70
71	60.86	36.57	60.70	36.83	60.54	37.10	60.38	37.36	71
72	61.72	37.08	61.55	37.35	61.39	37.62	61.23	37.89	72
73	62.57	37.60	62.41	37.87	62.24	38.14	62.08	38.41	73
74	63.43	38.11	63.26	38.39	63.10	38.66	62.93	38.94	74
75	64.29	38.63	64.12	38.91	63.95	39.19	63.78	39.47	75
76	65.14	39.14	64.97	39.43	64.80	39.71	64.63	39.99	76
77	66.00	39.66	65.83	39.95	65.65	40.23	65.48	40.52	77
78	66.86	40.17	66.68	40.46	66.51	40.75	66.33	41.04	78
79	67.72	40.69	67.54	40.98	67.36	41.28	67.18	41.57	79
80	68.57	41.20	68.39	41.50	68.21	41.80	68.03	42.10	80
81	69.43	41.72	69.25	42.02	69.06	42.32	68.88	42.62	81
82	70.29	42.23	70.10	42.54	69.92	42.84	69.73	43.15	82
83	71.14	42.75	70.96	43.06	70.77	43.37	70.58	43.68	83
84	72.00	43.26	71.81	43.58	71.62	43.89	71.43	44.20	84
85	72.86	43.78	72.67	44.10	72.47	44.41	72.28	44.73	85
86	73.72	44.29	73.52	44.61	73.33	44.93	73.13	45.25	86
87	74.57	44.81	74.38	45.13	74.18	45.46	73.98	45.78	87
88	75.43	45.32	75.23	45.65	75.03	45.98	74.83	46.31	88
89	76.29	45.84	76.09	46.17	75.88	46.50	75.68	46.83	89
90	77.15	46.35	76.94	46.69	76.74	47.02	76.53	47.36	90
91	78.00	46.87	77.80	47.21	77.59	47.55	77.38	47.89	91
92	78.86	47.38	78.65	47.73	78.44	48.07	78.23	48.41	92
93	79.72	47.90	79.51	48.25	79.30	48.59	79.08	48.94	93
94	80.57	48.41	80.36	48.76	80.15	49.11	79.93	49.47	94
95	81.43	48.93	81.22	49.28	81.00	49.64	80.78	49.99	95
96	82.29	49.44	82.07	49.80	81.85	50.16	81.63	50.52	96
97	83.15	49.96	82.93	50.32	82.71	50.68	82.48	51.04	97
98	84.00	50.47	83.78	50.84	83.56	51.20	83.33	51.57	98
99	84.86	50.99	84.64	51.36	84.41	51.73	84.18	52.10	99
100	85.72	51.50	85.49	51.88	85.26	52.25	85.04	52.62	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	59°.		58¾°.		58½°.		58¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	32°.		32¼°.		32½°.		32¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.85	0.53	0.85	0.53	0.84	0.54	0.84	0.54	1
2	1.70	1.06	1.69	1.07	1.69	1.07	1.68	1.08	2
3	2.54	1.59	2.54	1.60	2.53	1.61	2.52	1.62	3
4	3.39	2.12	3.38	2.13	3.37	2.15	3.36	2.16	4
5	4.24	2.65	4.23	2.67	4.22	2.69	4.21	2.70	5
6	5.09	3.18	5.07	3.20	5.06	3.22	5.05	3.25	6
7	5.94	3.71	5.92	3.74	5.90	3.76	5.89	3.79	7
8	6.78	4.24	6.77	4.27	6.75	4.30	6.73	4.33	8
9	7.63	4.77	7.61	4.80	7.59	4.84	7.57	4.87	9
10	8.48	5.30	8.46	5.34	8.43	5.37	8.41	5.41	10
11	9.33	5.83	9.30	5.87	9.28	5.91	9.25	5.95	11
12	10.18	6.36	10.15	6.40	10.12	6.45	10.09	6.49	12
13	11.02	6.89	10.99	6.94	10.96	6.98	10.93	7.03	13
14	11.87	7.42	11.84	7.47	11.81	7.52	11.77	7.57	14
15	12.72	7.95	12.69	8.00	12.65	8.06	12.62	8.11	15
16	13.57	8.48	13.53	8.54	13.49	8.60	13.46	8.66	16
17	14.42	9.01	14.38	9.07	14.34	9.13	14.30	9.20	17
18	15.26	9.54	15.22	9.61	15.18	9.67	15.14	9.74	18
19	16.11	10.07	16.07	10.14	16.02	10.21	15.98	10.28	19
20	16.96	10.60	16.91	10.67	16.87	10.75	16.82	10.82	20
21	17.81	11.13	17.76	11.21	17.71	11.28	17.66	11.36	21
22	18.66	11.66	18.61	11.74	18.55	11.82	18.50	11.90	22
23	19.51	12.19	19.45	12.27	19.40	12.36	19.34	12.44	23
24	20.35	12.72	20.30	12.81	20.24	12.90	20.18	12.98	24
25	21.20	13.25	21.14	13.34	21.08	13.43	21.03	13.52	25
26	22.05	13.78	21.99	13.87	21.93	13.97	21.87	14.07	26
27	22.90	14.31	22.83	14.41	22.77	14.51	22.71	14.61	27
28	23.75	14.84	23.68	14.94	23.61	15.04	23.55	15.15	28
29	24.59	15.37	24.53	15.47	24.46	15.58	24.39	15.69	29
30	25.44	15.90	25.37	16.01	25.30	16.12	25.23	16.23	30
31	26.29	16.43	26.22	16.54	26.15	16.66	26.07	16.77	31
32	27.14	16.96	27.06	17.08	26.99	17.19	26.91	17.31	32
33	27.99	17.49	27.91	17.61	27.83	17.73	27.75	17.85	33
34	28.83	18.02	28.75	18.14	28.68	18.27	28.60	18.39	34
35	29.68	18.55	29.60	18.68	29.52	18.81	29.44	18.93	35
36	30.53	19.08	30.45	19.21	30.36	19.34	30.28	19.48	36
37	31.38	19.61	31.29	19.74	31.21	19.88	31.12	20.02	37
38	32.23	20.14	32.14	20.28	32.05	20.42	31.96	20.56	38
39	33.07	20.67	32.98	20.81	32.89	20.95	32.80	21.10	39
40	33.92	21.20	33.83	21.34	33.74	21.49	33.64	21.64	40
41	34.77	21.73	34.67	21.88	34.58	22.03	34.48	22.18	41
42	35.62	22.26	35.52	22.41	35.42	22.57	35.32	22.72	42
43	36.47	22.79	36.37	22.95	36.27	23.10	36.16	23.26	43
44	37.31	23.32	37.21	23.48	37.11	23.64	37.01	23.80	44
45	38.16	23.85	38.06	24.01	37.95	24.18	37.85	24.34	45
46	39.01	24.38	38.90	24.55	38.80	24.72	38.69	24.88	46
47	39.86	24.91	39.75	25.08	39.64	25.25	39.53	25.43	47
48	40.71	25.44	40.59	25.61	40.48	25.79	40.37	25.97	48
49	41.55	25.97	41.44	26.15	41.33	26.33	41.21	26.51	49
50	42.40	26.50	42.29	26.68	42.17	26.86	42.05	27.05	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	58°.		57¾°.		57½°.		57¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	32°.		32¼°.		32½°.		32¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	43.25	27.03	43.13	27.21	43.01	27.40	42.89	27.59	51
52	44.10	27.56	43.98	27.75	43.86	27.94	43.73	28.13	52
53	44.95	28.09	44.82	28.28	44.70	28.48	44.58	28.67	53
54	45.79	28.62	45.67	28.82	45.54	29.01	45.42	29.21	54
55	46.64	29.15	46.52	29.35	46.39	29.55	46.26	29.75	55
56	47.49	29.68	47.36	29.88	47.23	30.09	47.10	30.29	56
57	48.34	30.21	48.21	30.42	48.07	30.63	47.94	30.84	57
58	49.19	30.74	49.05	30.95	48.92	31.16	48.78	31.38	58
59	50.03	31.27	49.90	31.48	49.76	31.70	49.62	31.92	59
60	50.88	31.80	50.74	32.02	50.60	32.24	50.46	32.46	60
61	51.73	32.33	51.59	32.55	51.45	32.78	51.30	33.00	61
62	52.58	32.85	52.44	33.08	52.29	33.31	52.14	33.54	62
63	53.43	33.38	53.28	33.62	53.13	33.85	52.99	34.08	63
64	54.28	33.91	54.13	34.15	53.98	34.39	53.83	34.62	64
65	55.12	34.44	54.97	34.68	54.82	34.92	54.67	35.16	65
66	55.97	34.97	55.82	35.22	55.66	35.46	55.51	35.70	66
67	56.82	35.50	56.66	35.75	56.51	36.00	56.35	36.25	67
68	57.67	36.03	57.51	36.29	57.35	36.54	57.19	36.79	68
69	58.52	36.56	58.36	36.82	58.19	37.07	58.03	37.33	69
70	59.36	37.09	59.20	37.35	59.04	37.61	58.87	37.87	70
71	60.21	37.62	60.05	37.89	59.88	38.15	59.71	38.41	71
72	61.06	38.15	60.89	38.42	60.72	38.69	60.55	38.95	72
73	61.91	38.68	61.74	38.95	61.57	39.22	61.40	39.49	73
74	62.76	39.21	62.58	39.49	62.41	39.76	62.24	40.03	74
75	63.60	39.74	63.43	40.02	63.25	40.30	63.08	40.57	75
76	64.45	40.27	64.28	40.55	64.10	40.83	63.92	41.11	76
77	65.30	40.80	65.12	41.09	64.94	41.37	64.76	41.66	77
78	66.15	41.33	65.97	41.62	65.78	41.91	65.60	42.20	78
79	67.00	41.86	66.81	42.16	66.63	42.45	66.44	42.74	79
80	67.84	42.39	67.66	42.69	67.47	42.98	67.28	43.28	80
81	68.69	42.92	68.50	43.22	68.31	43.52	68.12	43.82	81
82	69.54	43.45	69.35	43.76	69.16	44.06	68.97	44.36	82
83	70.39	43.98	70.20	44.29	70.00	44.60	69.81	44.90	83
84	71.24	44.51	71.04	44.82	70.84	45.13	70.65	45.44	84
85	72.08	45.04	71.89	45.36	71.69	45.67	71.49	45.98	85
86	72.93	45.57	72.73	45.89	72.53	46.21	72.33	46.52	86
87	73.78	46.10	73.58	46.42	73.38	46.75	73.17	47.06	87
88	74.63	46.63	74.42	46.96	74.22	47.28	74.01	47.61	88
89	75.48	47.16	75.27	47.49	75.06	47.82	74.85	48.15	89
90	76.32	47.69	76.12	48.03	75.91	48.36	75.69	48.69	90
91	77.17	48.22	76.96	48.56	76.75	48.89	76.53	49.23	91
92	78.02	48.75	77.81	49.09	77.59	49.43	77.38	49.77	92
93	78.87	49.28	78.65	49.63	78.44	49.97	78.22	50.31	93
94	79.72	49.81	79.50	50.16	79.28	50.51	79.06	50.85	94
95	80.56	50.34	80.34	50.69	80.12	51.04	79.90	51.39	95
96	81.41	50.87	81.19	51.23	80.97	51.58	80.74	51.93	96
97	82.26	51.40	82.04	51.76	81.81	52.12	81.58	52.47	97
98	83.11	51.93	82.88	52.29	82.65	52.66	82.42	53.02	98
99	83.96	52.46	83.73	52.83	83.50	53.19	83.26	53.56	99
100	84.80	52.99	84.57	53.36	84.34	53.73	84.10	54.10	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	58°.		57¾°.		57½°.		57¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	33°.		33¼°.		33½°.		33¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.84	0.54	0.84	0.55	0.83	0.55	0.83	0.56	1
2	1.68	1.09	1.67	1.10	1.67	1.10	1.66	1.11	2
3	2.52	1.63	2.51	1.64	2.50	1.66	2.49	1.67	3
4	3.35	2.18	3.35	2.19	3.34	2.21	3.33	2.22	4
5	4.19	2.72	4.18	2.74	4.17	2.76	4.16	2.78	5
6	5.03	3.27	5.02	3.29	5.00	3.31	4.99	3.33	6
7	5.87	3.81	5.85	3.84	5.84	3.86	5.82	3.89	7
8	6.71	4.36	6.69	4.39	6.67	4.42	6.65	4.44	8
9	7.55	4.90	7.53	4.93	7.50	4.97	7.48	5.00	9
10	8.39	5.45	8.36	5.48	8.34	5.52	8.31	5.56	10
11	9.23	5.99	9.20	6.03	9.17	6.07	9.15	6.11	11
12	10.06	6.54	10.04	6.58	10.01	6.62	9.98	6.67	12
13	10.90	7.08	10.87	7.13	10.84	7.18	10.81	7.22	13
14	11.74	7.62	11.71	7.68	11.67	7.73	11.64	7.78	14
15	12.58	8.17	12.54	8.22	12.51	8.28	12.47	8.33	15
16	13.42	8.71	13.38	8.77	13.34	8.83	13.30	8.89	16
17	14.26	9.26	14.22	9.32	14.18	9.38	14.13	9.44	17
18	15.10	9.80	15.05	9.87	15.01	9.93	14.97	10.00	18
19	15.93	10.35	15.89	10.42	15.84	10.49	15.80	10.56	19
20	16.77	10.89	16.73	10.97	16.68	11.04	16.63	11.11	20
21	17.61	11.44	17.56	11.51	17.51	11.59	17.46	11.67	21
22	18.45	11.98	18.40	12.06	18.35	12.14	18.29	12.22	22
23	19.29	12.53	19.23	12.61	19.18	12.69	19.12	12.78	23
24	20.13	13.07	20.07	13.16	20.01	13.25	19.96	13.33	24
25	20.97	13.62	20.91	13.71	20.85	13.80	20.79	13.89	25
26	21.81	14.16	21.74	14.26	21.68	14.35	21.62	14.44	26
27	22.64	14.71	22.58	14.80	22.51	14.90	22.45	15.00	27
28	23.48	15.25	23.42	15.35	23.35	15.45	23.28	15.56	28
29	24.32	15.79	24.25	15.90	24.18	16.01	24.11	16.11	29
30	25.16	16.34	25.09	16.45	25.02	16.56	24.94	16.67	30
31	26.00	16.88	25.92	17.00	25.85	17.11	25.78	17.22	31
32	26.84	17.43	26.76	17.55	26.68	17.66	26.61	17.78	32
33	27.68	17.97	27.60	18.09	27.52	18.21	27.44	18.33	33
34	28.51	18.52	28.43	18.64	28.35	18.77	28.27	18.89	34
35	29.35	19.06	29.27	19.19	29.19	19.32	29.10	19.44	35
36	30.19	19.61	30.11	19.74	30.02	19.87	29.93	20.00	36
37	31.03	20.15	30.94	20.29	30.85	20.42	30.76	20.56	37
38	31.87	20.70	31.78	20.84	31.69	20.97	31.60	21.11	38
39	32.71	21.24	32.62	21.38	32.52	21.53	32.43	21.67	39
40	33.55	21.79	33.45	21.93	33.36	22.08	33.26	22.22	40
41	34.39	22.33	34.29	22.48	34.19	22.63	34.09	22.78	41
42	35.22	22.87	35.12	23.03	35.02	23.18	34.92	23.33	42
43	36.06	23.42	35.96	23.58	35.86	23.73	35.75	23.89	43
44	36.90	23.96	36.80	24.12	36.69	24.29	36.58	24.45	44
45	37.74	24.51	37.63	24.67	37.52	24.84	37.42	25.00	45
46	38.58	25.05	38.47	25.22	38.36	25.39	38.25	25.56	46
47	39.42	25.60	39.31	25.77	39.19	25.94	39.08	26.11	47
48	40.26	26.14	40.14	26.32	40.03	26.49	39.91	26.67	48
49	41.09	26.69	40.98	26.87	40.86	27.04	40.74	27.22	49
50	41.93	27.23	41.81	27.41	41.69	27.60	41.57	27.78	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	57°.		56¾°.		56½°.		56¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	33°.		33¼°.		33½°.		33¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	42.77	27.78	42.65	27.96	42.53	28.15	42.40	28.33	51
52	43.61	28.32	43.40	28.51	43.36	28.70	43.24	28.89	52
53	44.45	28.87	44.32	29.06	44.20	29.25	44.07	29.45	53
54	45.29	29.41	45.16	29.61	45.03	29.80	44.90	30.00	54
55	46.13	29.96	46.00	30.16	45.86	30.36	45.73	30.56	55
56	46.97	30.50	46.83	30.70	46.70	30.91	46.56	31.11	56
57	47.80	31.04	47.67	31.25	47.53	31.46	47.39	31.67	57
58	48.64	31.59	48.50	31.80	48.37	32.01	48.23	32.22	58
59	49.48	32.13	49.34	32.35	49.20	32.56	49.06	32.78	59
60	50.32	32.68	50.18	32.90	50.03	33.12	49.89	33.33	60
61	51.16	33.22	51.01	33.45	50.87	33.67	50.72	33.89	61
62	52.00	33.77	51.85	33.99	51.70	34.22	51.55	34.45	62
63	52.84	34.31	52.69	34.54	52.53	34.77	52.38	35.00	63
64	53.67	34.86	53.52	35.09	53.37	35.32	53.21	35.56	64
65	54.51	35.40	54.36	35.64	54.20	35.88	54.05	36.11	65
66	55.35	35.95	55.19	36.19	55.04	36.43	54.88	36.67	66
67	56.19	36.49	56.03	36.74	55.87	36.98	55.71	37.22	67
68	57.03	37.04	56.87	37.28	56.70	37.53	56.54	37.78	68
69	57.87	37.58	57.70	37.83	57.54	38.08	57.37	38.33	69
70	58.71	38.12	58.54	38.38	58.37	38.64	58.20	38.89	70
71	59.55	38.67	59.38	38.93	59.21	39.19	59.03	39.45	71
72	60.38	39.21	60.21	39.48	60.04	39.74	59.87	40.00	72
73	61.22	39.76	61.05	40.03	60.87	40.29	60.70	40.56	73
74	62.06	40.30	61.89	40.57	61.71	40.84	61.53	41.11	74
75	62.90	40.85	62.72	41.12	62.54	41.40	62.36	41.67	75
76	63.74	41.39	63.56	41.67	63.38	41.95	63.19	42.22	76
77	64.58	41.94	64.39	42.22	64.21	42.50	64.02	42.78	77
78	65.42	42.48	65.23	42.77	65.04	43.05	64.85	43.33	78
79	66.25	43.03	66.07	43.32	65.88	43.60	65.69	43.89	79
80	67.09	43.57	66.90	43.86	66.71	44.15	66.52	44.45	80
81	67.93	44.12	67.74	44.41	67.54	44.71	67.35	45.00	81
82	68.77	44.66	68.58	44.96	68.38	45.26	68.18	45.56	82
83	69.61	45.21	69.41	45.51	69.21	45.81	69.01	46.11	83
84	70.45	45.75	70.25	46.06	70.05	46.36	69.84	46.67	84
85	71.29	46.29	71.08	46.60	70.88	46.91	70.67	47.22	85
86	72.13	46.84	71.92	47.15	71.71	47.47	71.51	47.78	86
87	72.96	47.38	72.76	47.70	72.55	48.02	72.34	48.33	87
88	73.80	47.93	73.59	48.25	73.38	48.57	73.17	48.89	88
89	74.64	48.47	74.43	48.80	74.22	49.12	74.00	49.45	89
90	75.48	49.02	75.27	49.35	75.05	49.67	74.83	50.00	90
91	76.32	49.56	76.10	49.89	75.88	50.23	75.66	50.56	91
92	77.16	50.11	76.94	50.44	76.72	50.78	76.50	51.11	92
93	78.00	50.65	77.77	50.99	77.55	51.33	77.33	51.67	93
94	78.84	51.20	78.61	51.54	78.39	51.88	78.16	52.22	94
95	79.67	51.74	79.45	52.09	79.22	52.43	78.99	52.78	95
96	80.51	52.29	80.28	52.64	80.05	52.99	79.82	53.33	96
97	81.35	52.83	81.12	53.18	80.89	53.54	80.65	53.89	97
98	82.19	53.37	81.96	53.73	81.72	54.09	81.48	54.45	98
99	83.03	53.92	82.79	54.28	82.55	54.64	82.32	55.00	99
100	83.87	54.46	83.63	54.83	83.39	55.19	83.15	55.56	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	57°.		56¾°.		56½°.		56¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	34°.		34¼°.		34½°.		34¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.83	0.56	0.83	0.56	0.82	0.57	0.82	0.57	1
2	1.66	1.12	1.65	1.13	1.65	1.13	1.64	1.14	2
3	2.49	1.68	2.48	1.69	2.47	1.70	2.46	1.71	3
4	3.32	2.24	3.31	2.25	3.30	2.27	3.29	2.28	4
5	4.15	2.80	4.13	2.81	4.12	2.83	4.11	2.85	5
6	4.97	3.36	4.96	3.38	4.94	3.40	4.93	3.42	6
7	5.80	3.91	5.79	3.94	5.77	3.96	5.75	3.99	7
8	6.63	4.47	6.61	4.50	6.59	4.53	6.57	4.56	8
9	7.46	5.03	7.44	5.07	7.42	5.10	7.39	5.13	9
10	8.29	5.59	8.27	5.63	8.24	5.66	8.22	5.70	10
11	9.12	6.15	9.09	6.19	9.07	6.23	9.04	6.27	11
12	9.95	6.71	9.92	6.75	9.89	6.80	9.86	6.84	12
13	10.78	7.27	10.75	7.32	10.71	7.36	10.68	7.41	13
14	11.61	7.83	11.57	7.88	11.54	7.93	11.50	7.98	14
15	12.44	8.39	12.40	8.44	12.36	8.50	12.32	8.55	15
16	13.26	8.95	13.23	9.00	13.19	9.06	13.15	9.12	16
17	14.09	9.51	14.05	9.57	14.01	9.63	13.97	9.69	17
18	14.92	10.07	14.88	10.13	14.83	10.20	14.79	10.26	18
19	15.75	10.62	15.71	10.69	15.66	10.76	15.61	10.83	19
20	16.58	11.18	16.53	11.26	16.48	11.33	16.43	11.40	20
21	17.41	11.74	17.36	11.82	17.31	11.89	17.25	11.97	21
22	18.24	12.30	18.18	12.38	18.13	12.46	18.08	12.54	22
23	19.07	12.86	19.01	12.94	18.95	13.03	18.90	13.11	23
24	19.90	13.42	19.84	13.51	19.78	13.59	19.72	13.68	24
25	20.73	13.98	20.66	14.07	20.60	14.16	20.54	14.25	25
26	21.55	14.54	21.49	14.63	21.43	14.73	21.36	14.82	26
27	22.38	15.10	22.32	15.20	22.25	15.29	22.18	15.39	27
28	23.21	15.66	23.14	15.76	23.08	15.86	23.01	15.96	28
29	24.04	16.22	23.97	16.32	23.90	16.43	23.83	16.53	29
30	24.87	16.78	24.80	16.88	24.72	16.99	24.65	17.10	30
31	25.70	17.33	25.62	17.45	25.55	17.56	25.47	17.67	31
32	26.53	17.89	26.45	18.01	26.37	18.12	26.29	18.24	32
33	27.36	18.45	27.28	18.57	27.20	18.69	27.11	18.81	33
34	28.19	19.01	28.10	19.14	28.02	19.26	27.94	19.38	34
35	29.02	19.57	28.93	19.70	28.84	19.82	28.76	19.95	35
36	29.85	20.13	29.76	20.26	29.67	20.39	29.58	20.52	36
37	30.67	20.69	30.58	20.82	30.49	20.96	30.40	21.09	37
38	31.50	21.25	31.41	21.39	31.32	21.52	31.22	21.66	38
39	32.33	21.81	32.24	21.95	32.14	22.09	32.04	22.23	39
40	33.16	22.37	33.06	22.51	32.97	22.66	32.87	22.80	40
41	33.99	22.93	33.89	23.08	33.79	23.22	33.69	23.37	41
42	34.82	23.49	34.72	23.64	34.61	23.79	34.51	23.94	42
43	35.65	24.05	35.54	24.20	35.44	24.36	35.33	24.51	43
44	36.48	24.60	36.37	24.76	36.26	24.92	36.15	25.08	44
45	37.31	25.16	37.20	25.33	37.09	25.49	36.97	25.65	45
46	38.14	25.72	38.02	25.89	37.91	26.05	37.80	26.22	46
47	38.96	26.28	38.85	26.45	38.73	26.62	38.62	26.79	47
48	39.79	26.84	39.68	27.01	39.56	27.19	39.44	27.36	48
49	40.62	27.40	40.50	27.58	40.38	27.75	40.26	27.93	49
50	41.45	27.96	41.33	28.14	41.21	28.32	41.08	28.50	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	56°.		55¾°.		55½°.		55¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	34°.		34¼°.		34½°.		34¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	42.28	28.52	42.16	28.70	42.03	28.89	41.90	29.07	51
52	43.11	29.08	42.98	29.27	42.85	29.45	42.73	29.64	52
53	43.94	29.64	43.81	29.83	43.68	30.02	43.55	30.21	53
54	44.77	30.20	44.64	30.39	44.50	30.59	44.37	30.78	54
55	45.60	30.76	45.46	30.95	45.33	31.15	45.19	31.35	55
56	46.43	31.31	46.29	31.52	46.15	31.72	46.01	31.92	56
57	47.26	31.87	47.12	32.08	46.98	32.29	46.83	32.49	57
58	48.08	32.43	47.94	32.64	47.80	32.85	47.66	33.06	58
59	48.91	32.99	48.77	33.21	48.62	33.42	48.48	33.63	59
60	49.74	33.55	49.60	33.77	49.45	33.98	49.30	34.20	60
61	50.57	34.11	50.42	34.33	50.27	34.55	50.12	34.77	61
62	51.40	34.67	51.25	34.89	51.10	35.12	50.94	35.34	62
63	52.23	35.23	52.08	35.46	51.92	35.68	51.76	35.91	63
64	53.06	35.79	52.90	36.02	52.74	36.25	52.59	36.48	64
65	53.89	36.35	53.73	36.58	53.57	36.82	53.41	37.05	65
66	54.72	36.91	54.55	37.15	54.39	37.38	54.23	37.62	66
67	55.55	37.47	55.38	37.71	55.22	37.95	55.05	38.19	67
68	56.37	38.03	56.21	38.27	56.04	38.52	55.87	38.76	68
69	57.20	38.58	57.03	38.83	56.86	39.08	56.69	39.33	69
70	58.03	39.14	57.86	39.40	57.69	39.65	57.52	39.90	70
71	58.86	39.70	58.69	39.96	58.51	40.21	58.34	40.47	71
72	59.69	40.26	59.51	40.52	59.34	40.78	59.16	41.04	72
73	60.52	40.82	60.34	41.08	60.16	41.35	59.98	41.61	73
74	61.35	41.38	61.17	41.65	60.99	41.91	60.80	42.18	74
75	62.18	41.94	61.99	42.21	61.81	42.48	61.62	42.75	75
76	63.01	42.50	62.82	42.77	62.63	43.05	62.45	43.32	76
77	63.84	43.06	63.65	43.34	63.46	43.61	63.27	43.89	77
78	64.66	43.62	64.47	43.90	64.28	44.18	64.09	44.46	78
79	65.49	44.18	65.30	44.46	65.11	44.75	64.91	45.03	79
80	66.32	44.74	66.13	45.02	65.93	45.31	65.73	45.60	80
81	67.15	45.29	66.95	45.59	66.75	45.88	66.55	46.17	81
82	67.98	45.85	67.78	46.15	67.58	46.45	67.38	46.74	82
83	68.81	46.41	68.61	46.71	68.40	47.01	68.20	47.31	83
84	69.64	46.97	69.43	47.28	69.23	47.58	69.02	47.88	84
85	70.47	47.53	70.26	47.84	70.05	48.14	69.84	48.45	85
86	71.30	48.09	71.09	48.40	70.87	48.71	70.66	49.02	86
87	72.13	48.65	71.91	48.96	71.70	49.28	71.48	49.59	87
88	72.96	49.21	72.74	49.53	72.52	49.84	72.30	50.16	88
89	73.78	49.77	73.57	50.09	73.35	50.41	73.13	50.73	89
90	74.61	50.33	74.39	50.65	74.17	50.98	73.95	51.30	90
91	75.44	50.89	75.22	51.22	75.00	51.54	74.77	51.87	91
92	76.27	51.45	76.05	51.78	75.82	52.11	75.59	52.44	92
93	77.10	52.00	76.87	52.34	76.64	52.68	76.41	53.01	93
94	77.93	52.56	77.70	52.90	77.47	53.24	77.23	53.58	94
95	78.76	53.12	78.53	53.47	78.29	53.81	78.06	54.15	95
96	79.59	53.68	79.35	54.03	79.12	54.37	78.88	54.72	96
97	80.42	54.24	80.18	54.59	79.94	54.94	79.70	55.29	97
98	81.25	54.80	81.01	55.15	80.76	55.51	80.52	55.86	98
99	82.07	55.36	81.83	55.72	81.59	56.07	81.34	56.43	99
100	82.90	55.92	82.66	56.28	82.41	56.64	82.16	57.00	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	56°.		55¾°.		55½°.		55¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	35°.		35¼°.		35½°.		35¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.82	0.57	0.82	0.58	0.81	0.58	0.81	0.58	1
2	1.64	1.15	1.63	1.15	1.63	1.16	1.62	1.17	2
3	2.46	1.72	2.45	1.73	2.44	1.74	2.43	1.75	3
4	3.28	2.29	3.27	2.31	3.26	2.32	3.25	2.34	4
5	4.10	2.87	4.08	2.89	4.07	2.90	4.06	2.92	5
6	4.91	3.44	4.90	3.46	4.88	3.48	4.87	3.51	6
7	5.73	4.02	5.72	4.04	5.70	4.06	5.68	4.09	7
8	6.55	4.59	6.53	4.62	6.51	4.65	6.49	4.67	8
9	7.37	5.16	7.35	5.19	7.33	5.23	7.30	5.26	9
10	8.19	5.74	8.17	5.77	8.14	5.81	8.12	5.84	10
11	9.01	6.31	8.98	6.35	8.96	6.39	8.93	6.43	11
12	9.83	6.88	9.80	6.93	9.77	6.97	9.74	7.01	12
13	10.65	7.46	10.62	7.50	10.58	7.55	10.55	7.60	13
14	11.47	8.03	11.43	8.08	11.40	8.13	11.36	8.18	14
15	12.29	8.60	12.25	8.66	12.21	8.71	12.17	8.76	15
16	13.11	9.18	13.07	9.23	13.03	9.29	12.99	9.35	16
17	13.93	9.75	13.88	9.81	13.84	9.87	13.80	9.93	17
18	14.74	10.32	14.70	10.39	14.65	10.45	14.61	10.52	18
19	15.56	10.90	15.52	10.97	15.47	11.03	15.42	11.10	19
20	16.38	11.47	16.33	11.54	16.28	11.61	16.23	11.68	20
21	17.20	12.05	17.15	12.12	17.10	12.19	17.04	12.27	21
22	18.02	12.62	17.97	12.70	17.91	12.78	17.85	12.85	22
23	18.84	13.19	18.78	13.27	18.72	13.36	18.67	13.44	23
24	19.66	13.77	19.60	13.85	19.54	13.94	19.48	14.02	24
25	20.48	14.34	20.42	14.43	20.35	14.52	20.29	14.61	25
26	21.30	14.91	21.23	15.01	21.17	15.10	21.10	15.19	26
27	22.12	15.49	22.05	15.58	21.98	15.68	21.91	15.77	27
28	22.94	16.06	22.87	16.16	22.80	16.26	22.72	16.36	28
29	23.76	16.63	23.68	16.74	23.61	16.84	23.54	16.94	29
30	24.57	17.21	24.50	17.31	24.42	17.42	24.35	17.53	30
31	25.39	17.78	25.32	17.89	25.24	18.00	25.16	18.11	31
32	26.21	18.35	26.13	18.47	26.05	18.58	25.97	18.70	32
33	27.03	18.93	26.95	19.05	26.87	19.16	26.78	19.28	33
34	27.85	19.50	27.77	19.62	27.68	19.74	27.59	19.86	34
35	28.67	20.08	28.58	20.20	28.49	20.32	28.41	20.45	35
36	29.49	20.65	29.40	20.78	29.31	20.91	29.22	21.03	36
37	30.31	21.22	30.22	21.35	30.12	21.49	30.03	21.62	37
38	31.13	21.80	31.03	21.93	30.94	22.07	30.84	22.20	38
39	31.95	22.37	31.85	22.51	31.75	22.65	31.65	22.79	39
40	32.77	22.94	32.67	23.09	32.56	23.23	32.46	23.37	40
41	33.59	23.52	33.48	23.66	33.38	23.81	33.27	23.95	41
42	34.40	24.09	34.30	24.24	34.19	24.39	34.09	24.54	42
43	35.22	24.66	35.12	24.82	35.01	24.97	34.90	25.12	43
44	36.04	25.24	35.93	25.39	35.82	25.55	35.71	25.71	44
45	36.86	25.81	36.75	25.97	36.64	26.13	36.52	26.29	45
46	37.68	26.38	37.57	26.55	37.45	26.71	37.33	26.88	46
47	38.50	26.96	38.38	27.13	38.26	27.29	38.14	27.46	47
48	39.32	27.53	39.20	27.70	39.08	27.87	38.96	28.04	48
49	40.14	28.11	40.02	28.28	39.89	28.45	39.77	28.63	49
50	40.96	28.68	40.83	28.86	40.71	29.04	40.58	29.21	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	55°.		54¾°.		54½°.		54¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	35°.		35¼°.		35½°.		35¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	41.78	29.25	41.65	29.43	41.52	29.62	41.39	29.80	51
52	42.60	29.83	42.47	30.01	42.33	30.20	42.20	30.38	52
53	43.42	30.40	43.28	30.59	43.15	30.78	43.01	30.97	53
54	44.23	30.97	44.10	31.17	43.96	31.36	43.82	31.55	54
55	45.05	31.55	44.92	31.74	44.78	31.94	44.64	32.13	55
56	45.87	32.12	45.73	32.32	45.59	32.52	45.45	32.72	56
57	46.69	32.69	46.55	32.90	46.40	33.10	46.26	33.30	57
58	47.51	33.27	47.37	33.47	47.22	33.68	47.07	33.89	58
59	48.33	33.84	48.18	34.05	48.03	34.26	47.88	34.47	59
60	49.15	34.41	49.00	34.63	48.85	34.84	48.69	35.05	60
61	49.97	34.99	49.82	35.21	49.66	35.42	49.51	35.64	61
62	50.79	35.56	50.63	35.78	50.48	36.00	50.32	36.22	62
63	51.61	36.14	51.45	36.36	51.29	36.58	51.13	36.81	63
64	52.43	36.71	52.27	36.94	52.10	37.16	51.94	37.39	64
65	53.24	37.28	53.08	37.51	52.92	37.75	52.75	37.98	65
66	54.06	37.86	53.90	38.09	53.73	38.33	53.56	38.56	66
67	54.88	38.43	54.71	38.67	54.55	38.91	54.38	39.14	67
68	55.70	39.00	55.53	39.25	55.36	39.49	55.19	39.73	68
69	56.52	39.58	56.35	39.82	56.17	40.07	56.00	40.31	69
70	57.34	40.15	57.16	40.40	56.99	40.65	56.81	40.90	70
71	58.16	40.72	57.98	40.98	57.80	41.23	57.62	41.48	71
72	58.98	41.30	58.80	41.55	58.62	41.81	58.43	42.07	72
73	59.80	41.87	59.61	42.13	59.43	42.39	59.24	42.65	73
74	60.62	42.44	60.43	42.71	60.24	42.97	60.06	43.23	74
75	61.44	43.02	61.25	43.29	61.06	43.55	60.87	43.82	75
76	62.26	43.59	62.06	43.86	61.87	44.13	61.68	44.40	76
77	63.07	44.17	62.88	44.44	62.69	44.71	62.49	44.99	77
78	63.89	44.74	63.70	45.02	63.50	45.29	63.30	45.57	78
79	64.71	45.31	64.51	45.59	64.32	45.88	64.11	46.16	79
80	65.53	45.89	65.33	46.17	65.13	46.46	64.93	46.74	80
81	66.35	46.46	66.15	46.75	65.94	47.04	65.74	47.32	81
82	67.17	47.03	66.96	47.33	66.76	47.62	66.55	47.91	82
83	67.99	47.61	67.78	47.90	67.57	48.20	67.36	48.49	83
84	68.81	48.18	68.60	48.48	68.39	48.78	68.17	49.08	84
85	69.63	48.75	69.41	49.06	69.20	49.36	68.98	49.66	85
86	70.45	49.33	70.23	49.63	70.01	49.94	69.80	50.25	86
87	71.27	49.90	71.05	50.21	70.83	50.52	70.61	50.83	87
88	72.09	50.47	71.86	50.79	71.64	51.10	71.42	51.41	88
89	72.90	51.05	72.68	51.37	72.46	51.68	72.23	52.00	89
90	73.72	51.62	73.50	51.94	73.27	52.26	73.04	52.58	90
91	74.54	52.20	74.31	52.52	74.08	52.84	73.85	53.17	91
92	75.36	52.77	75.13	53.10	74.90	53.42	74.66	53.75	92
93	76.18	53.34	75.95	53.67	75.71	54.01	75.48	54.34	93
94	77.00	53.92	76.76	54.25	76.52	54.59	76.29	54.92	94
95	77.82	54.49	77.58	54.83	77.34	55.17	77.10	55.50	95
96	78.64	55.06	78.40	55.41	78.16	55.75	77.91	56.09	96
97	79.46	55.64	79.21	55.98	78.97	56.33	78.72	56.67	97
98	80.28	56.21	80.03	56.56	79.78	56.91	79.53	57.26	98
99	81.10	56.78	80.85	57.14	80.60	57.49	80.35	57.84	99
100	81.92	57.36	81.66	57.71	81.41	58.07	81.16	58.42	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	55°.		54¾°.		54½°.		54¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	36°.		36¼°.		36½°.		36¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.81	0.59	0.81	0.59	0.80	0.59	0.80	0.60	1
2	1.62	1.18	1.61	1.18	1.61	1.19	1.60	1.20	2
3	2.43	1.76	2.42	1.77	2.41	1.78	2.40	1.79	3
4	3.24	2.35	3.23	2.37	3.22	2.38	3.21	2.39	4
5	4.05	2.94	4.03	2.96	4.02	2.97	4.01	2.99	5
6	4.85	3.53	4.84	3.55	4.82	3.57	4.81	3.59	6
7	5.66	4.11	5.65	4.14	5.63	4.16	5.61	4.19	7
8	6.47	4.70	6.45	4.73	6.43	4.76	6.41	4.79	8
9	7.28	5.29	7.26	5.32	7.23	5.35	7.21	5.38	9
10	8.09	5.88	8.06	5.91	8.04	5.95	8.01	5.98	10
11	8.90	6.47	8.87	6.50	8.84	6.54	8.81	6.58	11
12	9.71	7.05	9.68	7.10	9.65	7.14	9.62	7.18	12
13	10.52	7.64	10.48	7.69	10.45	7.73	10.42	7.78	13
14	11.33	8.23	11.29	8.28	11.25	8.33	11.22	8.38	14
15	12.14	8.82	12.10	8.87	12.06	8.92	12.02	8.97	15
16	12.94	9.40	12.90	9.46	12.86	9.52	12.82	9.57	16
17	13.75	9.99	13.71	10.05	13.67	10.11	13.62	10.17	17
18	14.56	10.58	14.52	10.64	14.47	10.71	14.42	10.77	18
19	15.37	11.17	15.32	11.23	15.27	11.30	15.22	11.37	19
20	16.18	11.76	16.13	11.83	16.08	11.90	16.03	11.97	20
21	16.99	12.34	16.94	12.42	16.88	12.49	16.83	12.56	21
22	17.80	12.93	17.74	13.01	17.68	13.09	17.63	13.16	22
23	18.61	13.52	18.55	13.60	18.49	13.68	18.43	13.76	23
24	19.42	14.11	19.35	14.19	19.29	14.28	19.23	14.36	24
25	20.23	14.69	20.16	14.78	20.10	14.87	20.03	14.96	25
26	21.03	15.28	20.97	15.37	20.90	15.47	20.83	15.56	26
27	21.84	15.87	21.77	15.97	21.70	16.06	21.63	16.15	27
28	22.65	16.46	22.58	16.56	22.51	16.66	22.44	16.75	28
29	23.46	17.05	23.39	17.15	23.31	17.25	23.24	17.35	29
30	24.27	17.63	24.19	17.74	24.12	17.84	24.04	17.95	30
31	25.08	18.22	25.00	18.33	24.92	18.44	24.84	18.55	31
32	25.89	18.81	25.81	18.92	25.72	19.03	25.64	19.15	32
33	26.70	19.40	26.61	19.51	26.53	19.63	26.44	19.74	33
34	27.51	19.98	27.42	20.10	27.33	20.22	27.24	20.34	34
35	28.32	20.57	28.23	20.70	28.13	20.82	28.04	20.94	35
36	29.12	21.16	29.03	21.29	28.94	21.41	28.85	21.54	36
37	29.93	21.75	29.84	21.88	29.74	22.01	29.65	22.14	37
38	30.74	22.34	30.64	22.47	30.55	22.60	30.45	22.74	38
39	31.55	22.92	31.45	23.06	31.35	23.20	31.25	23.33	39
40	32.36	23.51	32.26	23.65	32.15	23.79	32.05	23.93	40
41	33.17	24.10	33.06	24.24	32.96	24.39	32.85	24.53	41
42	33.98	24.69	33.87	24.84	33.76	24.98	33.65	25.13	42
43	34.79	25.27	34.68	25.43	34.57	25.58	34.45	25.73	43
44	35.60	25.86	35.48	26.02	35.37	26.17	35.26	26.33	44
45	36.41	26.45	36.29	26.61	36.17	26.77	36.06	26.92	45
46	37.21	27.04	37.10	27.20	36.98	27.36	36.86	27.52	46
47	38.02	27.63	37.90	27.79	37.78	27.96	37.66	28.12	47
48	38.83	28.21	38.71	28.38	38.59	28.55	38.46	28.72	48
49	39.64	28.80	39.52	28.97	39.39	29.15	39.26	29.32	49
50	40.45	29.39	40.32	29.57	40.19	29.74	40.06	29.92	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	54°.		53¾°.		53½°.		53¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	36°.		36¼°.		36½°.		36¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	41.26	29.98	41.13	30.16	41.00	30.34	40.86	30.51	51
52	42.07	30.56	41.94	30.75	41.80	30.93	41.67	31.11	52
53	42.88	31.15	42.74	31.34	42.60	31.53	42.47	31.71	53
54	43.69	31.74	43.55	31.93	43.41	32.12	43.27	32.31	54
55	44.50	32.33	44.35	32.52	44.21	32.72	44.07	32.91	55
56	45.30	32.92	45.16	33.11	45.02	33.31	44 87	33.51	56
57	46.11	33.50	45.97	33.70	45.82	33.90	45.67	34.10	57
58	46.92	34.09	46.77	34.30	46.62	34.50	46.47	34.70	58
59	47.73	34.68	47.58	34.89	47.43	35.09	47.27	35.30	59
60	48.54	35.27	48.39	35.48	48.23	35.69	48.08	35.90	60
61	49.35	35.85	49.19	36.07	49.04	36.28	48.88	36.50	61
62	50.16	36.44	50.00	36.66	49.84	36.88	49.68	37.10	62
63	50.97	37.03	50.81	37.25	50.64	37.47	50.48	37.69	63
64	51.78	37.62	51.61	37.84	51.45	38.07	51.28	38.29	64
65	52.59	38.21	52.42	38.44	52.25	38.66	52.08	38.89	65
66	53.40	38.79	53.23	39.03	53.05	39.26	52.88	39.49	66
67	54.20	39.38	54.03	39.62	53.86	39.85	53.68	40.09	67
68	55.01	39.97	54.84	40.21	54.66	40.45	54.49	40.69	68
69	55.82	40.56	55.64	40.80	55.47	41.04	55.29	41.28	69
70	56.63	41.14	56.45	41.39	56.27	41.64	56.09	41.88	70
71	57.44	41.73	57.26	41.98	57.07	42.23	56.89	42.48	71
72	58.25	42.32	58.06	42.57	57.88	42.83	57.69	43.08	72
73	59.06	42.91	58.87	43.17	58.68	43.42	58.49	43.68	73
74	59.87	43.50	59.68	43.76	59.49	44.02	59.29	44.28	74
75	60.68	44.08	60.48	44.35	60.29	44.61	60.09	44.87	75
76	61.49	44.67	61.29	44.94	61.09	45.21	60.90	45.47	76
77	62.29	45.26	62.10	45.53	61.90	45.80	61.70	46.07	77
78	63.10	45.85	62.90	46.12	62.70	46.40	62.50	46.67	78
79	63.91	46.44	63.71	46.71	63.50	46.99	63.30	47.27	79
80	64.72	47.02	64.52	47 30	64.31	47.59	64.10	47.87	80
81	65.53	47.61	65.32	47.90	65.11	48.18	64.90	48.46	81
82	66.34	48.20	66.13	48.49	65.92	48.78	65.70	49.06	82
83	67.15	48.79	66.93	49.08	66.72	49.37	66.50	49.66	83
84	67.96	49.37	67.74	49.67	67.52	49.97	67.31	50.26	84
85	68.77	49.96	68.55	50.26	68.33	50.56	68.11	50.86	85
86	69.58	50.55	69.35	50.85	69.13	51.15	68.91	51.46	86
87	70.38	51.14	70.16	51.44	69.94	51.75	69.71	52.05	87
88	71.19	51.73	70.97	52.04	70.74	52.34	70.51	52.65	88
89	72.00	52.31	71.77	52.63	71.54	52.94	71.31	53.25	89
90	72.81	52.90	72.58	53.22	72.35	53.53	72.11	53.85	90
91	73.62	53.49	73.39	53.81	73.15	54.13	72.91	54.45	91
92	74.43	54.08	74.19	54.40	73.95	54.72	73.72	55.05	92
93	75.24	54.66	75.00	54.99	74.76	55.32	74.52	55.64	93
94	76.05	55.25	75.81	55.58	75.56	55.91	75.32	56.24	94
95	76.86	55.84	76.61	56.17	76.37	56.51	76.12	56.84	95
96	77.67	56.43	77.42	56.77	77.17	57.10	76.92	57.44	96
97	78.47	57.02	78.23	57.36	77.97	57.70	77 72	58.04	97
98	79.28	57.60	79.03	57.95	78.78	58.29	78.52	58.64	98
99	80.09	58.19	79.84	58.54	79.58	58.89	79.32	59.23	99
100	80.90	58.78	80.64	59.13	80.39	59.48	80.13	59.83	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	54°.		53¾°.		53½°		53¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	37°.		37¼°.		37½°.		37¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.80	0.60	0.80	0.61	0.79	0.61	0.79	0.61	1
2	1.60	1.20	1.59	1.21	1.59	1.22	1.58	1.22	2
3	2.40	1.81	2.39	1.82	2.38	1.83	2.37	1.84	3
4	3.19	2.41	3.18	2.42	3.17	2.44	3.16	2.45	4
5	3.99	3.01	3.98	3.03	3.97	3.04	3.95	3.06	5
6	4.79	3.61	4.78	3.63	4.76	3.65	4.74	3.67	6
7	5.59	4.21	5.57	4.24	5.55	4.26	5.53	4.29	7
8	6.39	4.81	6.37	4.84	6.35	4.87	6.33	4.90	8
9	7.19	5.42	7.16	5.45	7.14	5.48	7.12	5.51	9
10	7.99	6.02	7.96	6.05	7.93	6.09	7.91	6.12	10
11	8.78	6.62	8.76	6.66	8.73	6.70	8.70	6.73	11
12	9.58	7.22	9.55	7.26	9.52	7.31	9.49	7.35	12
13	10.38	7.82	10.35	7.87	10.31	7.91	10.28	7.96	13
14	11.18	8.43	11.14	8.47	11.11	8.52	11.07	8.57	14
15	11.98	9.03	11.94	9.08	11.90	9.13	11.86	9.18	15
16	12.78	9.63	12.74	9.68	12.69	9.74	12.65	9.80	16
17	13.58	10.23	13.53	10.29	13.49	10.35	13.44	10.41	17
18	14.38	10.83	14.33	10.90	14.28	10.96	14.23	11.02	18
19	15.17	11.43	15.12	11.50	15.07	11.57	15.02	11.63	19
20	15.97	12.04	15.92	12.11	15.87	12.18	15.81	12.24	20
21	16.77	12.64	16.72	12.71	16.66	12.78	16.60	12.86	21
22	17.57	13.24	17.51	13.32	17.45	13.39	17.40	13.47	22
23	18.37	13.84	18.31	13.92	18.25	14.00	18.19	14.08	23
24	19.17	14.44	19.10	14.53	19.04	14.61	18.98	14.69	24
25	19.97	15.05	19.90	15.13	19.83	15.22	19.77	15.31	25
26	20.76	15.65	20.70	15.74	20.63	15.83	20.56	15.92	26
27	21.56	16.25	21.49	16.34	21.42	16.44	21.35	16.53	27
28	22.36	16.85	22.29	16.95	22.21	17.05	22.14	17.14	28
29	23.16	17.45	23.08	17.55	23.01	17.65	22.93	17.75	29
30	23.96	18.05	23.88	18.16	23.80	18.26	23.72	18.37	30
31	24.76	18.66	24.68	18.76	24.59	18.87	24.51	18.98	31
32	25.56	19.26	25.47	19.37	25.39	19.48	25.30	19.59	32
33	26.35	19.86	26.27	19.97	26.18	20.09	26.09	20.20	33
34	27.15	20.46	27.06	20.58	26.97	20.70	26.88	20.82	34
35	27.95	21.06	27.86	21.19	27.77	21.31	27.67	21.43	35
36	28.75	21.67	28.66	21.79	28.56	21.92	28.46	22.04	36
37	29.55	22.27	29.45	22.40	29.35	22.52	29.26	22.65	37
38	30.35	22.87	30.25	23.00	30.15	23.13	30.05	23.26	38
39	31.15	23.47	31.04	23.61	30.94	23.74	30.84	23.88	39
40	31.95	24.07	31.84	24.21	31.73	24.35	31.63	24.49	40
41	32.74	24.67	32.64	24.82	32.53	24.96	32.42	25.10	41
42	33.54	25.28	33.43	25.42	33.32	25.57	33.21	25.71	42
43	34.34	25.88	34.23	26.03	34.11	26.18	34.00	26.33	43
44	35.14	26.48	35.02	26.63	34.91	26.79	34.79	26.94	44
45	35.94	27.08	35.82	27.24	35.70	27.39	35.58	27.55	45
46	36.74	27.68	36.62	27.84	36.49	28.00	36.37	28.16	46
47	37.54	28.29	37.41	28.45	37.29	28.61	37.16	28.77	47
48	38.33	28.89	38.21	29.05	38.08	29.22	37.95	29.39	48
49	39.13	29.49	39.00	29.66	38.87	29.83	38.74	30.00	49
50	39.93	30.09	39.80	30.26	39.67	30.44	39.53	30.61	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	53°.		52¾°.		52½°.		52¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	37°.		37¼°.		37½°.		37¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	40.73	30.69	40.60	30.87	40.46	31.05	40.33	31.22	51
52	41.53	31.29	41.39	31.48	41.25	31.66	41.12	31.84	52
53	42.33	31.90	42.19	32.08	42.05	32.26	41.91	32.45	53
54	43.13	32.50	42.98	32.69	42.84	32.87	42.70	33.06	54
55	43.92	33.10	43.78	33.29	43.63	33.48	43.49	33.67	55
56	44.72	33.70	44.58	33.90	44.43	34.09	44.28	34.28	56
57	45.52	34.30	45.37	34.50	45.22	34.70	45.07	34.90	57
58	46.32	34.91	46.17	35.11	46.01	35.31	45.86	35.51	58
59	47.12	35.51	46.96	35.71	46.81	35.92	46.65	36.12	59
60	47.92	36.11	47.76	36.32	47.60	36.53	47.44	36.73	60
61	48.72	36.71	48.56	36.92	48.39	37.13	48.23	37.35	61
62	49.52	37.31	49.35	37.53	49.19	37.74	49.02	37.96	62
63	50.31	37.91	50.15	38.13	49.98	38.35	49.81	38.57	63
64	51.11	38.52	50.94	38.74	50.77	38.96	50.60	39.18	64
65	51.91	39.12	51.74	39.34	51.57	39.57	51.39	39.79	65
66	52.71	39.72	52.54	39.95	52.36	40.18	52.19	40.41	66
67	53.51	40.32	53.33	40.55	53.15	40.79	52.98	41.02	67
68	54.31	40.92	54.13	41.16	53.95	41.40	53.77	41.63	68
69	55.11	41.53	54.92	41.77	54.74	42.00	54.56	42.24	69
70	55.90	42.13	55.72	42.37	55.53	42.61	55.35	42.86	70
71	56.70	42.73	56.52	42.98	56.33	43.22	56.14	43.47	71
72	57.50	43.33	57.31	43.58	57.12	43.83	56.93	44.08	72
73	58.30	43.93	58.11	44.19	57.91	44.44	57.72	44.69	73
74	59.10	44.53	58.90	44.79	58.71	45.05	58.51	45.30	74
75	59.90	45.14	59.70	45.40	59.50	45.66	59.30	45.92	75
76	60.70	45.74	60.50	46.00	60.29	46.27	60.09	46.53	76
77	61.49	46.34	61.29	46.61	61.09	46.87	60.88	47.14	77
78	62.29	46.94	62.09	47.21	61.88	47.48	61.67	47.75	78
79	63.09	47.54	62.88	47.82	62.67	48.09	62.46	48.37	79
80	63.89	48.15	63.68	48.42	63.47	48.70	63.26	48.98	80
81	64.69	48.75	64.48	49.03	64.26	49.31	64.05	49.59	81
82	65.49	49.35	65.27	49.63	65.05	49.92	64.84	50.20	82
83	66.29	49.95	66.07	50.24	65.85	50.53	65.63	50.81	83
84	67.09	50.55	66.86	50.84	66.64	51.14	66.42	51.43	84
85	67.88	51.15	67.66	51.45	67.44	51.74	67.21	52.04	85
86	68.68	51.76	68.46	52.06	68.23	52.35	68.00	52.65	86
87	69.48	52.36	69.25	52.66	69.02	52.96	68.79	53.26	87
88	70.28	52.96	70.05	53.27	69.82	53.57	69.58	53.88	88
89	71.08	53.56	70.84	53.87	70.61	54.18	70.37	54.49	89
90	71.88	54.16	71.64	54.48	71.40	54.79	71.16	55.10	90
91	72.68	54.77	72.44	55.08	72.20	55.40	71.95	55.71	91
92	73.47	55.37	73.23	55.69	72.99	56.01	72.74	56.32	92
93	74.27	55.97	74.03	56.29	73.78	56.61	73.53	56.94	93
94	75.07	56.57	74.82	56.90	74.58	57.22	74.32	57.55	94
95	75.87	57.17	75.62	57.50	75.37	57.83	75.12	58.16	95
96	76.67	57.77	76.42	58.11	76.16	58.44	75.91	58.77	96
97	77.47	58.38	77.21	58.71	76.96	59.05	76.70	59.39	97
98	78.27	58.98	78.01	59.32	77.75	59.66	77.49	60.00	98
99	79.06	59.58	78.80	59.92	78.54	60.27	78.28	60.61	99
100	79.86	60.18	79.60	60.53	79.34	60.88	79.07	61.22	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	53°.		52¾°.		52½°.		52¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	38°.		38¼°.		38½°.		38¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.79	0.62	0.79	0.62	0.78	0.62	0.78	0.63	1
2	1.58	1.23	1.57	1.24	1.57	1.25	1.56	1.25	2
3	2.36	1.85	2.36	1.86	2.35	1.87	2.34	1.88	3
4	3.15	2.46	3.14	2.48	3.13	2.49	3.12	2.50	4
5	3.94	3.08	3.93	3.10	3.91	3.11	3.90	3.13	5
6	4.73	3.69	4.71	3.71	4.70	3.74	4.68	3.76	6
7	5.52	4.31	5.50	4.33	5.48	4.36	5.46	4.38	7
8	6.30	4.93	6.28	4.95	6.26	4.98	6.24	5.01	8
9	7.09	5.54	7.07	5.57	7.04	5.60	7.02	5.63	9
10	7.88	6.16	7.85	6.19	7.83	6.23	7.80	6.26	10
11	8.67	6.77	8.64	6.81	8.61	6.85	8.58	6.89	11
12	9.46	7.39	9.42	7.43	9.39	7.47	9.36	7.51	12
13	10.24	8.00	10.21	8.05	10.17	8.09	10.14	8.14	13
14	11.03	8.62	10.99	8.67	10.96	8.72	10.92	8.76	14
15	11.82	9.23	11.78	9.29	11.74	9.34	11.70	9.39	15
16	12.61	9.85	12.57	9.91	12.52	9.96	12.48	10.01	16
17	13.40	10.47	13.35	10.52	13.30	10.58	13.26	10.64	17
18	14.18	11.08	14.14	11.14	14.09	11.21	14.04	11.27	18
19	14.97	11.70	14.92	11.76	14.87	11.83	14.82	11.89	19
20	15.76	12.31	15.71	12.38	15.65	12.45	15.60	12.52	20
21	16.55	12.93	16.49	13.00	16.43	13.07	16.38	13.14	21
22	17.34	13.54	17.28	13.62	17.22	13.70	17.16	13.77	22
23	18.12	14.16	18.06	14.24	18.00	14.32	17.94	14.40	23
24	18.91	14.78	18.85	14.86	18.78	14.94	18.72	15.02	24
25	19.70	15.39	19.63	15.48	19.57	15.56	19.50	15.65	25
26	20.49	16.01	20.42	16.10	20.35	16.19	20.28	16.27	26
27	21.28	16.62	21.20	16.72	21.13	16.81	21.06	16.90	27
28	22.06	17.24	21.99	17.33	21.91	17.43	21.84	17.53	28
29	22.85	17.85	22.77	17.95	22.70	18.05	22.62	18.15	29
30	23.64	18.47	23.56	18.57	23.48	18.68	23.40	18.78	30
31	24.43	19.09	24.34	19.19	24.26	19.30	24.18	19.40	31
32	25.22	19.70	25.13	19.81	25.04	19.92	24.96	20.03	32
33	26.00	20.32	25.92	20.43	25.83	20.54	25.74	20.66	33
34	26.79	20.93	26.70	21.05	26.61	21.17	26.52	21.28	34
35	27.58	21.55	27.49	21.67	27.39	21.79	27.30	21.91	35
36	28.37	22.16	28.27	22.29	28.17	22.41	28.08	22.53	36
37	29.16	22.78	29.06	22.91	28.96	23.03	28.86	23.16	37
38	29.94	23.40	29.84	23.53	29.74	23.66	29.64	23.79	38
39	30.73	24.01	30.63	24.14	30.52	24.28	30.42	24.41	39
40	31.52	24.63	31.41	24.76	31.30	24.90	31.20	25.04	40
41	32.31	25.24	32.20	25.38	32.09	25.52	31.98	25.66	41
42	33.10	25.86	32.98	26.00	32.87	26.15	32.76	26.29	42
43	33.88	26.47	33.77	26.62	33.65	26.77	33.54	26.91	43
44	34.67	27.09	34.55	27.24	34.43	27.39	34.31	27.54	44
45	35.46	27.70	35.34	27.86	35.22	28.01	35.09	28.17	45
46	36.25	28.32	36.12	28.48	36.00	28.64	35.87	28.79	46
47	37.04	28.94	36.91	29.10	36.78	29.26	36.65	29.42	47
48	37.82	29.55	37.70	29.72	37.57	29.88	37.43	30.04	48
49	38.61	30.17	38.48	30.34	38.35	30.50	38.21	30.67	49
50	39.40	30.78	39.27	30.95	39.13	31.13	38.99	31.30	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	52°.		51¾°.		51½°.		51¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	38°.		38¼°.		38½°.		38¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	40.19	31.40	40.05	31.57	39.91	31.75	39.77	31.92	51
52	40.98	32.01	40.84	32.19	40.70	32.37	40.55	32.55	52
53	41.76	32.63	41.62	32.81	41.48	32.99	41.33	33.17	53
54	42.55	33.25	42.41	33.43	42.26	33.62	42.11	33.80	54
55	43.34	33.86	43.19	34.05	43.04	34.24	42.89	34.43	55
56	44.13	34.48	43.98	34.67	43.83	34.86	43.67	35.05	56
57	44.92	35.09	44.76	35.29	44.61	35.48	44.45	35.68	57
58	45.70	35.71	45.55	35.91	45.39	36.11	45.23	36.30	58
59	46.49	36.32	46.33	36.53	46.17	36.73	46.01	36.93	59
60	47.28	36.94	47.12	37.15	46.96	37.35	46.79	37.56	60
61	48.07	37.56	47.90	37.76	47.74	37.97	47.57	38.18	61
62	48.86	38.17	48.69	38.38	48.52	38.60	48.35	38.81	62
63	49.64	38.79	49.47	39.00	49.30	39.22	49.13	39.43	63
64	50.43	39.40	50.26	39.62	50.09	39.84	49.91	40.06	64
65	51.22	40.02	51.05	40.24	50.87	40.46	50.69	40.69	65
66	52.01	40.63	51.83	40.86	51.65	41.09	51.47	41.31	66
67	52.80	41.25	52.62	41.48	52.43	41.71	52.25	41.94	67
68	53.58	41.86	53.40	42.10	53.22	42.33	53.03	42.56	68
69	54.37	42.48	54.19	42.72	54.00	42.95	53.81	43.19	69
70	55.16	43.10	54.97	43.34	54.78	43.58	54.59	43.81	70
71	55.95	43.71	55.76	43.96	55.57	44.20	55.37	44.44	71
72	56.74	44.33	56.54	44.57	56.35	44.82	56.15	45.07	72
73	57.52	44.94	57.33	45.19	57.13	45.44	56.93	45.69	73
74	58.31	45.56	58.11	45.81	57.91	46.07	57.71	46.32	74
75	59.10	46.17	58.90	46.43	58.70	46.69	58.49	46.94	75
76	59.89	46.79	59.68	47.05	59.48	47.31	59.27	47.57	76
77	60.68	47.41	60.47	47.67	60.26	47.93	60.05	48.20	77
78	61.46	48.02	61.25	48.29	61.04	48.56	60.83	48.82	78
79	62.25	48.64	62.04	48.91	61.83	49.18	61.61	49.45	79
80	63.04	49.25	62.83	49.53	62.61	49.80	62.39	50.07	80
81	63.83	49.87	63.61	50.15	63.39	50.42	63.17	50.70	81
82	64.62	50.48	64.40	50.77	64.17	51.05	63.95	51.33	82
83	65.40	51.10	65.18	51.38	64.96	51.67	64.73	51.95	83
84	66.19	51.72	65.97	52.00	65.74	52.29	65.51	52.58	84
85	66.98	52.33	66.75	52.62	66.52	52.91	66.29	53.20	85
86	67.77	52.95	67.54	53.24	67.30	53.54	67.07	53.83	86
87	68.56	53.56	68.32	53.86	68.09	54.16	67.85	54.46	87
88	69.34	54.18	69.11	54.48	68.87	54.78	68.63	55.08	88
89	70.13	54.79	69.89	55.10	69.65	55.40	69.41	55.71	89
90	70.92	55.41	70.68	55.72	70.43	56.03	70.19	56.33	90
91	71.71	56.03	71.46	56.34	71.22	56.65	70.97	56.96	91
92	72.50	56.64	72.25	56.96	72.00	57.27	71.75	57.58	92
93	73.29	57.26	73.03	57.58	72.78	57.89	72.53	58.21	93
94	74.07	57.87	73.82	58.19	73.57	58.52	73.31	58.84	94
95	74.86	58.49	74.61	58.81	74.35	59.14	74.09	59.46	95
96	75.65	59.10	75.39	59.43	75.13	59.76	74.87	60.09	96
97	76.44	59.72	76.18	60.05	75.91	60.38	75.65	60.71	97
98	77.23	60.33	76.96	60.67	76.70	61.01	76.43	61.34	98
99	78.01	60.95	77.75	61.29	77.48	61.63	77.21	61.97	99
100	78.80	61.57	78.53	61.91	78.26	62.25	77.99	62.59	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	52°.		51¾°.		51½°.		51¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	39°.		39¼°.		39½°.		39¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.78	0.63	0.77	0.63	0.77	0.64	0.77	0.64	1
2	1.55	1.26	1.55	1.27	1.54	1.27	1.54	1.28	2
3	2.33	1.89	2.32	1.90	2.31	1.91	2.31	1.92	3
4	3.11	2.52	3.10	2.53	3.09	2.54	3.08	2.56	4
5	3.89	3.15	3.87	3.16	3.86	3.18	3.84	3.20	5
6	4.66	3.78	4.65	3.80	4.63	3.82	4.61	3.84	6
7	5.44	4.41	5.42	4.43	5.40	4.45	5.38	4.48	7
8	6.22	5.03	6.20	5.06	6.17	5.09	6.15	5.12	8
9	6.99	5.66	6.97	5.69	6.94	5.72	6.92	5.75	9
10	7.77	6.29	7.74	6.33	7.72	6.36	7.69	6.39	10
11	8.55	6.92	8.52	6.96	8.49	7.00	8.46	7.03	11
12	9.33	7.55	9.29	7.59	9.26	7.63	9.23	7.67	12
13	10.10	8.18	10.07	8.23	10.03	8.27	9.99	8.31	13
14	10.88	8.81	10.84	8.86	10.80	8.91	10.76	8.95	14
15	11.66	9.44	11.62	9.49	11.57	9.54	11.53	9.59	15
16	12.43	10.07	12.39	10.12	12.35	10.18	12.30	10.23	16
17	13.21	10.70	13.16	10.76	13.12	10.81	13.07	10.87	17
18	13.99	11.33	13.94	11.39	13.89	11.45	13.84	11.51	18
19	14.77	11.96	14.71	12.02	14.66	12.09	14.61	12.15	19
20	15.54	12.59	15.49	12.65	15.43	12.72	15.38	12.79	20
21	16.32	13.22	16.26	13.29	16.20	13.36	16.15	13.43	21
22	17.10	13.85	17.04	13.92	16.98	13.99	16.91	14.07	22
23	17.87	14.47	17.81	14.55	17.75	14.63	17.68	14.71	23
24	18.65	15.10	18.59	15.18	18.52	15.27	18.45	15.35	24
25	19.43	15.73	19.36	15.82	19.29	15.90	19.22	15.99	25
26	20.21	16.36	20.13	16.45	20.06	16.54	19.99	16.63	26
27	20.98	16.99	20.91	17.08	20.83	17.17	20.76	17.26	27
28	21.76	17.62	21.68	17.72	21.61	17.81	21.53	17.90	28
29	22.54	18.25	22.46	18.35	22.38	18.45	22.30	18.54	29
30	23.31	18.88	23.23	18.98	23.15	19.08	23.07	19.18	30
31	24.09	19.51	24.01	19.61	23.92	19.72	23.83	19.82	31
32	24.87	20.14	24.78	20.25	24.69	20.35	24.60	20.46	32
33	25.65	20.77	25.55	20.88	25.46	20.99	25.37	21.10	33
34	26.42	21.40	26.33	21.51	26.24	21.63	26.14	21.74	34
35	27.20	22.03	27.10	22.14	27.01	22.26	26.91	22.38	35
36	27.98	22.66	27.88	22.78	27.78	22.90	27.68	23.02	36
37	28.75	23.28	28.65	23.41	28.55	23.53	28.45	23.66	37
38	29.53	23.91	29.43	24.04	29.32	24.17	29.22	24.30	38
39	30.31	24.54	30.20	24.68	30.09	24.81	29.98	24.94	39
40	31.09	25.17	30.98	25.31	30.86	25.44	30.75	25.58	40
41	31.86	25.80	31.75	25.94	31.64	26.08	31.52	26.22	41
42	32.64	26.43	32.52	26.57	32.41	26.72	32.29	26.86	42
43	33.42	27.06	33.30	27.21	33.18	27.35	33.06	27.50	43
44	34.19	27.69	34.07	27.84	33.95	27.99	33.83	28.14	44
45	34.97	28.32	34.85	28.47	34.72	28.62	34.60	28.77	45
46	35.75	28.95	35.62	29.10	35.49	29.26	35.37	29.41	46
47	36.53	29.58	36.40	29.74	36.27	29.90	36.14	30.05	47
48	37.30	30.21	37.17	30.37	37.04	30.53	36.90	30.69	48
49	38.08	30.84	37.95	31.00	37.81	31.17	37.67	31.33	49
50	38.86	31.47	38.72	31.64	38.58	31.80	38.44	31.97	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	51°.		50¾°.		50½°.		50¼°		

TABLE 4.—TRAVERSE TABLE.

Distance.	39°.		39¼°.		39½°.		39¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	39.63	32.10	39.49	32.27	39.35	32.44	39.21	32.61	51
52	40.41	32.72	40.27	32.90	40.12	33.08	39.98	33.25	52
53	41.19	33.35	41.04	33.53	40.90	33.71	40.75	33.89	53
54	41.97	33.98	41.82	34.17	41.67	34.35	41.52	34.53	54
55	42.74	34.61	42.59	34.80	42.44	34.98	42.29	35.17	55
56	43.52	35.24	43.37	35.43	43.21	35.62	43.06	35.81	56
57	44.30	35.87	44.14	36.06	43.98	36.26	43.82	36.45	57
58	45.07	36.50	44.91	36.70	44.75	36.89	44.59	37.09	58
59	45.85	37.13	45.69	37.33	45.53	37.53	45.36	37.73	59
60	46.63	37.76	46.46	37.96	46.30	38.16	46.13	38.37	60
61	47.41	38.39	47.24	38.60	47.07	38.80	46.90	39.01	61
62	48.18	39.02	48.01	39.23	47.84	39.44	47.67	39.65	62
63	48.96	39.65	48.79	39.86	48.61	40.07	48.44	40.28	63
64	49.74	40.28	49.56	40.49	49.38	40.71	49.21	40.92	64
65	50.51	40.91	50.34	41.13	50.16	41.35	49.97	41.56	65
66	51.29	41.54	51.11	41.76	50.93	41.98	50.74	42.20	66
67	52.07	42.16	51.88	42.39	51.70	42.62	51.51	42.84	67
68	52.85	42.79	52.66	43.02	52.47	43.25	52.28	43.48	68
69	53.62	43.42	53.43	43.66	58.24	43.89	53.05	44.12	69
70	54.40	44.05	54.21	44.29	54.01	44.53	53.82	44.76	70
71	55.18	44.68	54.98	44.92	54.79	45.16	54.59	45.40	71
72	55.95	45.31	55.76	45.55	55.56	45.80	55.36	46.04	72
73	56.73	45.94	56.53	46.19	56.33	46.43	56.13	46.68	73
74	57.51	46.57	57.31	46.82	57.10	47.07	56.89	47.32	74
75	58.29	47.20	58.08	47.45	57.87	47.71	57.66	47.96	75
76	59.06	47.83	58.85	48.09	58.64	48.34	58.43	48.60	76
77	59.84	48.46	59.63	48.72	59.42	48.98	59.20	49.24	77
78	60.62	49.09	60.40	49.35	60.19	49.61	59.97	49.88	78
79	61.39	49.72	61.18	49.98	60.96	50.25	60.74	50.52	79
80	62.17	50.35	61.95	50.62	61.73	50.89	61.51	51.16	80
81	62.95	50.97	62.73	51.25	62.50	51.52	62.28	51.79	81
82	63.73	51.60	63.50	51.88	63.27	52.16	63.04	52.43	82
83	64.50	52.23	64.27	52.51	64.04	52.79	63.81	53.07	83
84	65.28	52.86	65.05	53.15	64.82	53.43	64.58	53.71	84
85	66.06	53.49	65.82	53.78	65.59	54.07	65.35	54.35	85
86	66.83	54.12	66.60	54.41	66.36	54.70	66.12	54.99	86
87	67.61	54.75	67.37	55.05	67.13	55.34	66.89	55.63	87
88	68.39	55.38	68.15	55.68	67.90	55.97	67.66	56.27	88
89	69.17	56.01	68.92	56.31	68.67	56.61	68.43	56.91	89
90	69.94	56.64	69.70	56.94	69.45	57.25	69.20	57.55	90
91	70.72	57.27	70.47	57.58	70.22	57.88	69.96	58.19	91
92	71.50	57.90	71.24	58.21	70.99	58.52	70.73	58.83	92
93	72.27	58.53	72.02	58.84	71.76	59.16	71.50	59.47	93
94	73.05	59.16	72.79	59.47	72.53	59.79	72.27	60.11	94
95	73.83	59.79	73.57	60.11	73.30	60.43	73.04	60.75	95
96	74.61	60.41	74.34	60.74	74.08	61.06	73.81	61.39	96
97	75.38	61.04	75.12	61.37	74.85	61.70	74.58	62.03	97
98	76.16	61.67	75.89	62.01	75.62	62.34	75.35	62.67	98
99	76.94	62.30	76.66	62.64	76.39	62.97	76.12	63.30	99
100	77.71	62.93	77.44	63.27	77.16	63.61	76.88	63.94	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	51°.		50¾°.		50½°.		50¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	40°.		40¼°.		40½°.		40¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.77	0.64	0.76	0.65	0.76	0.65	0.76	0.65	1
2	1.53	1.29	1.53	1.29	1.52	1.30	1.52	1.31	2
3	2.30	1.93	2.29	1.94	2.28	1.95	2.27	1.96	3
4	3.06	2.57	3.05	2.58	3.04	2.60	3.03	2.61	4
5	3.83	3.21	3.82	3.23	3.80	3.25	3.79	3.26	5
6	4.60	3.86	4.58	3.88	4.56	3.90	4.55	3.92	6
7	5.36	4.50	5.34	4.52	5.32	4.55	5.30	4.57	7
8	6.13	5.14	6.11	5.17	6.08	5.20	6.06	5.22	8
9	6.89	5.79	6.87	5.82	6.84	5.85	6.82	5.87	9
10	7.66	6.43	7.63	6.46	7.60	6.49	7.58	6.53	10
11	8.43	7.07	8.40	7.11	8.36	7.14	8.33	7.18	11
12	9.19	7.71	9.16	7.75	9.12	7.79	9.09	7.83	12
13	9.96	8.36	9.92	8.40	9.89	8.44	9.85	8.49	13
14	10.72	9.00	10.69	9.05	10.65	9.09	10.61	9.14	14
15	11.49	9.64	11.45	9.69	11.41	9.74	11.36	9.79	15
16	12.26	10.28	12.21	10.34	12.17	10.39	12.12	10.44	16
17	13.02	10.93	12.97	10.98	12.93	11.04	12.88	11.10	17
18	13.79	11.57	13.74	11.63	13.69	11.69	13.64	11.75	18
19	14.55	12.21	14.50	12.28	14.45	12.34	14.39	12.40	19
20	15.32	12.86	15.26	12.92	15.21	12.99	15.15	13.06	20
21	16.09	13.50	16.03	13.57	15.97	13.64	15.91	13.71	21
22	16.85	14.14	16.79	14.21	16.73	14.29	16.67	14.36	22
23	17.62	14.78	17.55	14.86	17.49	14.94	17.42	15.01	23
24	18.39	15.43	18.32	15.51	18.25	15.59	18.18	15.67	24
25	19.15	16.07	19.08	16.15	19.01	16.24	18.94	16.32	25
26	19.92	16.71	19.84	16.80	19.77	16.89	19.70	16.97	26
27	20.68	17.36	20.61	17.45	20.53	17.54	20.45	17.62	27
28	21.45	18.00	21.37	18.09	21.29	18.18	21.21	18.28	28
29	22.22	18.64	22.13	18.74	22.05	18.83	21.97	18.93	29
30	22.98	19.28	22.90	19.38	22.81	19.48	22.73	19.58	30
31	23.75	19.93	23.66	20.03	23.57	20.13	23.48	20.24	31
32	24.51	20.57	24.42	20.68	24.33	20.78	24.24	20.89	32
33	25.28	21.21	25.19	21.32	25.09	21.43	25.00	21.54	33
34	26.05	21.85	25.95	21.97	25.85	22.08	25.76	22.19	34
35	26.81	22.50	26.71	22.61	26.61	22.73	26.51	22.85	35
36	27.58	23.14	27.48	23.26	27.37	23.38	27.27	23.50	36
37	28.34	23.78	28.24	23.91	28.14	24.03	28.03	24.15	37
38	29.11	24.43	29.00	24.55	28.90	24.68	28.79	24.80	38
39	29.88	25.07	29.77	25.20	29.66	25.33	29.55	25.46	39
40	30.64	25.71	30.53	25.84	30.42	25.98	30.30	26.11	40
41	31.41	26.35	31.29	26.49	31.18	26.63	31.06	26.76	41
42	32.17	27.00	32.06	27.14	31.94	27.28	31.82	27.42	42
43	32.94	27.64	32.82	27.78	32.70	27.93	32.58	28.07	43
44	33.71	28.28	33.58	28 43	33.46	28.58	33.33	28.72	44
45	34.47	28.93	34.35	29.08	34.22	29.23	34.09	29.37	45
46	35.24	29.57	35.11	29.72	34.98	29.87	34.85	30.03	46
47	36.00	30.21	35.87	30.37	35.74	30.52	35.61	30.68	47
48	36.77	30.85	36.64	31.01	36.50	31.17	36.36	31.33	48
49	37.54	31.50	37.40	31.66	37.26	31.82	37.12	31.99	49
50	38.30	32.14	38.16	32.31	38.02	32.47	37.88	32.64	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	50°.		49¾°.		49½°.		49¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	40°.		40¼°.		40½°.		40¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	39.07	32.78	38.92	32.95	38.78	33.12	38.64	33.29	51
52	39.83	33.42	39.69	33.60	39.54	33.77	39.39	33.94	52
53	40.60	34.07	40.45	34.24	40.30	34.42	40.15	34.60	53
54	41.37	34.71	41.21	34.89	41.06	35.07	40.91	35.25	54
55	42.13	35.35	41.98	35.54	41.82	35.72	41.67	35.90	55
56	42.90	36.00	42.74	36.18	42.58	36.37	42.42	36.55	56
57	43.66	36.64	43.50	36.83	43.34	37.02	43.18	37.21	57
58	44.43	37.28	44.27	37.48	44.10	37.67	43.94	37.86	58
59	45.20	37.92	45.03	38.12	44.86	38.32	44.70	38.51	59
60	45 96	38.57	45.79	38.77	45.62	38.97	45.45	39.17	60
61	46.73	39.21	46.56	39.41	46.38	39.62	46.21	39.82	61
62	47.49	39.85	47.32	40.06	47.15	40.27	46.97	40.47	62
63	48.26	40.50	48.08	40.71	47.91	40.92	47.73	41.12	63
64	49.03	41.14	48.85	41.35	48.67	41.56	48.48	41.78	64
65	49.79	41.78	49.61	42.00	49.43	42.21	49.24	42.43	65
66	50.56	42.42	50.37	42.64	50.19	42.86	50.00	43.08	66
67	51.32	43.07	51.14	43.29	50.95	43.51	50.76	43.73	67
68	52.09	43.71	51.90	43.94	51.71	44.16	51.51	44.39	68
69	52.86	44.35	52.66	44.58	52.47	44.81	52.27	45.04	69
70	53.62	45.00	53.43	45.23	53.23	45.46	53.03	45.69	70
71	54.39	45.64	54.19	45.87	53.99	46.11	53.79	46.35	71
72	55.16	46.28	54.95	46.52	54.75	46.76	54.54	47.00	72
73	55.92	46.92	55.72	47.17	55.51	47.41	55.30	47.65	73
74	56.69	47.57	56.48	47.81	56.27	48.06	56.06	48.30	74
75	57.45	48.21	57.24	48.46	57.03	48.71	56.82	48.96	75
76	58.22	48.85	58.01	49.11	57.79	49.36	57.57	49.61	76
77	58.99	49.49	58.77	49.75	58.55	50.01	58.33	50.26	77
78	59.75	50.14	59.53	50.40	59.31	50.66	59.09	50.92	78
79	60.52	50.78	60.30	51.04	60.07	51.31	59.85	51.57	79
80	61.28	51.42	61.06	51.69	60.83	51.96	60.61	52.22	80
81	62.05	52.07	61.82	52.34	61.59	52.61	61.36	52.87	81
82	62.82	52.71	62.59	52.98	62.35	53.25	62.12	53.53	82
83	63.58	53.35	63.35	53.63	63.11	53.90	62.88	54.18	83
84	64.35	53.99	64.11	54.27	63.87	54.55	63.64	54.83	84
85	65.11	54.64	64.87	54.92	64.63	55.20	64.39	55.48	85
86	65.88	55.28	65.64	55.57	65.39	55.85	65.15	56.14	86
87	66.65	55.92	66.40	56.21	66.16	56.50	65.91	56.79	87
88	67.41	56.57	67.16	56.86	66.92	57.15	66.67	57.44	88
89	68.18	57.21	67.93	57.51	67.68	57.80	67.42	58.10	89
90	68.94	57.85	68.69	58.15	68.44	58.45	68.18	58.75	90
91	69.71	58.49	69.45	58.80	69.20	59.10	68.94	59.40	91
92	70.48	59.14	70.22	59.44	69.96	59.75	69.70	60.05	92
93	71.24	59.78	70.98	60.09	70.72	60.40	70.45	60.71	93
94	72.01	60.42	71.74	60.74	71.48	61.05	71.21	61.36	94
95	72.77	61.06	72.51	61.38	72.24	61.70	71.97	62.01	95
96	73.54	61.71	73.27	62.03	73.00	62.35	72.73	62.66	96
97	74.31	62.35	74.03	62.67	73.76	63.00	73.48	63.32	97
98	75.07	62.99	74.80	63.32	74.52	63.65	74.24	63.97	98
99	75.84	63.64	75.56	63.97	75.28	64.30	75.00	64.62	99
100	76.60	64.28	76.32	64.61	73.04	64.94	75.76	65.28	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	50°.		49¾°.		49½°.		49¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	41°.		41¼°.		41½°.		41¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.75	0.66	0.75	0.66	0.75	0.66	0.75	0.67	1
2	1.51	1.31	1.50	1.32	1.50	1.33	1.49	1.33	2
3	2.26	1.97	2.26	1.98	2.25	1.99	2.24	2.00	3
4	3.02	2.62	3.01	2.64	3.00	2.65	2.98	2.66	4
5	3.77	3.28	3.76	3.30	3.74	3.31	3.73	3.33	5
6	4.53	3.94	4.51	3.96	4.49	3.98	4.48	4.00	6
7	5.28	4.59	5.26	4.62	5.24	4.64	5.22	4.66	7
8	6.04	5.25	6.01	5.27	5.99	5.30	5.97	5.33	8
9	6.79	5.90	6.77	5.93	6.74	5.96	6.71	5.99	9
10	7.55	6.56	7.52	6.59	7.49	6.63	7.46	6.66	10
11	8.30	7.22	8.27	7.25	8.24	7.29	8.21	7.32	11
12	9.06	7.87	9.02	7.91	8.99	7.95	8.95	7.99	12
13	9.81	8.53	9.77	8.57	9.74	8.61	9.70	8.66	13
14	10.57	9.18	10.53	9.23	10.49	9.28	10.44	9.32	14
15	11.32	9.84	11.28	9.89	11.23	9.94	11.19	9.99	15
16	12.08	10.50	12.03	10.55	11.98	10.60	11.94	10.65	16
17	12.83	11.15	12.78	11.21	12.73	11.26	12.68	11.32	17
18	13.58	11.81	13.53	11.87	13.48	11.93	13.43	11.99	18
19	14.34	12.47	14.28	12.53	14.23	12.59	14.18	12.65	19
20	15.09	13.12	15.04	13.19	14.98	13.25	14.92	13.32	20
21	15.85	13.78	15.79	13.85	15.73	13.92	15.67	13.98	21
22	16.60	14.43	16.54	14.51	16.48	14.58	16.41	14.65	22
23	17.36	15.09	17.29	15.16	17.23	15.24	17.16	15.32	23
24	18.11	15.75	18.04	15.82	17.97	15.90	17.91	15.98	24
25	18.87	16.40	18.80	16.48	18.72	16.57	18.65	16.65	25
26	19.62	17.06	19.55	17.14	19.47	17.23	19.40	17.31	26
27	20.38	17.71	20.30	17.80	20.22	17.89	20.14	17.98	27
28	21.13	18.37	21.05	18.46	20.97	18.55	20.89	18.64	28
29	21.89	19.03	21.80	19.12	21.72	19.22	21.64	19.31	29
30	22.64	19.68	22.56	19.78	22.47	19.88	22.38	19.98	30
31	23.40	20.34	23.31	20.44	23.22	20.54	23.13	20.64	31
32	24.15	20.99	24.06	21.10	23.97	21.20	23.87	21.31	32
33	24.91	21.65	24.81	21.76	24.72	21.87	24.62	21.97	33
34	25.66	22.31	25.56	22.42	25.46	22.53	25.37	22.64	34
35	26.41	22.96	26.31	23.08	26.21	23.19	26.11	23.31	35
36	27.17	23.62	27.07	23.74	26.96	23.85	26.86	23.97	36
37	27.92	24.27	27.82	24.40	27.71	24.52	27.60	24.64	37
38	28.68	24.93	28.57	25.06	28.46	25.18	28.35	25.30	38
39	29.43	25.59	29.32	25.71	29.21	25.84	29.10	25.97	39
40	30.19	26.24	30.07	26.37	29.96	26.50	29.84	26.64	40
41	30.94	26.90	30.83	27.03	30.71	27.17	30.59	27.30	41
42	31.70	27.55	31.58	27.69	31.46	27.83	31.33	27.97	42
43	32.45	28.21	32.33	28.35	32.21	28.49	32.08	28.63	43
44	33.21	28.87	33.08	29.01	32.95	29.16	32.83	29.30	44
45	33.96	29.52	33.83	29.67	33.70	29.82	33.57	29.97	45
46	34.72	30.18	34.58	30.33	34.45	30.48	34.32	30.63	46
47	35.47	30.83	35.34	30.99	35.20	31.14	35.06	31.30	47
48	36.23	31.49	36.09	31.65	35.95	31.81	35.81	31.96	48
49	36.98	32.15	36.84	32.31	36.70	32.47	36.56	32.63	49
50	37.74	32.80	37.59	32.97	37.45	33.13	37.30	33.29	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	49°.		48¾°.		48½°.		48¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	41°.		41¼°.		41½°.		41¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	38.49	33.46	38.34	33.63	38.20	33.79	38.05	33.96	51
52	39.24	34.12	39.10	34.29	38.95	34.46	38.79	34.63	52
53	40.00	34.77	39.85	34.95	39.69	35.12	39.54	35.29	53
54	40.75	35.43	40.60	35.60	40.44	35.78	40.29	35.96	54
55	41.51	36.08	41.35	36.26	41.19	36.44	41.03	36.62	55
56	42.26	36.74	42.10	36.92	41.94	37.11	41.78	37.29	56
57	43.02	37.40	42.85	37.58	42.69	37.77	42.53	37.96	57
58	43.77	38.05	43.61	38.24	43.44	38.43	43.27	38.62	58
59	44.53	38.71	44.36	38.90	44.19	39.09	44.02	39.29	59
60	45.28	39.36	45.11	39.56	44.94	39.76	44.76	39.95	60
61	46.04	40.02	45.86	40.22	45.69	40.42	45.51	40.62	61
62	46.79	40.68	46.61	40.88	46.44	41.08	46.26	41.28	62
63	47.55	41.33	47.37	41.54	47.18	41.75	47.00	41.95	63
64	48.30	41.99	48.12	42.20	47.93	42.41	47.75	42.62	64
65	49.06	42.64	48.87	42.86	48.68	43.07	48.49	43.28	65
66	49.81	43.30	49.62	43.52	49.43	43.73	49.24	43.95	66
67	50.57	43.96	50.37	44.18	50.18	44.40	49.99	44.61	67
68	51.32	44.61	51.13	44.84	50.93	45.06	50.73	45.28	68
69	52.07	45.27	51.88	45.49	51.68	45.72	51.48	45.95	69
70	52.83	45.92	52.63	46.15	52.43	46.38	52.22	46.61	70
71	53.58	46.58	53.38	46.81	53.18	47.05	52.97	47.28	71
72	54.34	47.24	54.13	47.47	53.92	47.71	53.72	47.94	72
73	55.09	47.89	54.88	48.13	54.67	48.37	54.46	48.61	73
74	55.85	48.55	55.64	48.79	55.42	49.03	55.21	49.28	74
75	56.60	49.20	56.39	49.45	56.17	49.70	55.95	49.94	75
76	57.36	49.86	57.14	50.11	56.92	50.36	56.70	50.61	76
77	58.11	50.52	57.89	50.77	57.67	51.02	57.45	51.27	77
78	58.87	51.17	58.64	51.43	58.42	51.68	58.19	51.94	78
79	59.62	51.83	59.40	52.09	59.17	52.35	58.94	52.60	79
80	60.38	52.48	60.15	52.75	59.92	53.01	59.68	53.27	80
81	61.13	53.14	60.90	53.41	60.67	53.67	60.43	53.94	81
82	61.89	53.80	61.65	54.07	61.41	54.33	61.18	54.60	82
83	62.64	54.45	62.40	54.73	62.16	55.00	61.92	55.27	83
84	63.40	55.11	63.15	55.39	62.91	55.66	62.67	55.93	84
85	64.15	55.77	63.91	56.04	63.66	56.32	63.41	56.60	85
86	64.91	56.42	64.66	56.70	64.41	56.99	64.16	57.27	86
87	65.66	57.08	65.41	57.36	65.16	57.65	64.91	57.93	87
88	66.41	57.73	66.16	58.02	65.91	58.31	65.65	58.60	88
89	67.17	58.39	66.91	58.68	66.66	58.97	66.40	59.26	89
90	67.92	59.05	67.67	59.34	67.41	59.64	67.15	59.93	90
91	68.68	59.70	68.42	60.00	68.15	60.30	67.89	60.60	91
92	69.43	60.36	69.17	60.66	68.90	60.96	68.64	61.26	92
93	70.19	61.01	69.92	61.32	69.65	61.62	69.38	61.93	93
94	70.94	61.67	70.67	61.98	70.40	62.29	70.13	62.59	94
95	71.70	62.33	71.43	62.64	71.15	62.95	70.88	63.26	95
96	72.45	62.98	72.18	63.30	71.90	63.61	71.62	63.92	96
97	73.21	63.64	72.93	63.96	72.65	64.27	72.37	64.59	97
98	73.96	64.29	73.68	64.62	73.40	64.94	73.11	65.26	98
99	74.72	64.95	74.43	65.28	74.15	65.60	73.86	65.92	99
100	75.47	65.61	75.18	65.93	74.90	66.26	74.61	66.59	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	49°.		48¾°.		48½°.		48¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	42°.		42¼°.		42½°.		42¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.74	0.67	0.74	0.67	0.74	0.68	0.73	0.68	1
2	1.49	1.34	1.48	1.34	1.47	1.35	1.47	1.36	2
3	2.23	2.01	2.22	2.02	2.21	2.03	2.20	2.04	3
4	2.97	2.68	2.96	2.69	2.95	2.70	2.94	2.72	4
5	3.72	3.35	3.70	3.36	3.69	3.38	3.67	3.39	5
6	4.46	4.01	4.44	4.03	4.42	4.05	4.41	4.07	6
7	5.20	4.68	5.18	4.71	5.16	4.73	5.14	4.75	7
8	5.95	5.35	5.92	5.38	5.90	5.40	5.87	5.43	8
9	6.69	6.02	6.66	6.05	6.64	6.08	6.61	6.11	9
10	7.43	6.69	7.40	6.72	7.37	6.76	7.34	6.79	10
11	8.17	7.36	8.14	7.40	8.11	7.43	8.08	7.47	11
12	8.92	8.03	8.88	8.07	8.85	8.11	8.81	8.15	12
13	9.66	8.70	9.62	8.74	9.58	8.78	9.55	8.82	13
14	10.40	9.37	10.36	9.41	10.32	9.46	10.28	9.50	14
15	11.15	10.04	11.10	10.09	11.06	10.13	11.01	10.18	15
16	11.89	10.71	11.84	10.76	11.80	10.81	11.75	10.86	16
17	12.63	11.38	12.58	11.43	12.53	11.49	12.48	11.54	17
18	13.38	12.04	13.32	12.10	13.27	12.16	13.22	12.22	18
19	14.12	12.71	14.06	12.77	14.01	12.84	13.95	12.90	19
20	14.86	13.38	14.80	13.45	14.75	13.51	14.69	13.58	20
21	15.61	14.05	15.54	14.12	15.48	14.19	15.42	14.25	21
22	16.35	14.72	16.28	14.79	16.22	14.86	16.16	14.93	22
23	17.09	15.39	17.03	15.46	16.96	15.54	16.89	15.61	23
24	17.84	16.06	17.77	16.14	17.69	16.21	17.62	16.29	24
25	18.58	16.73	18.51	16.81	18.43	16.89	18.36	16.97	25
26	19.32	17.40	19.25	17.48	19.17	17.57	19.09	17.65	26
27	20.06	18.07	19.99	18.15	19.91	18.24	19.83	18.33	27
28	20.81	18.74	20.73	18.83	20.64	18.92	20.56	19.01	28
29	21.55	19.40	21.47	19.50	21.38	19.59	21.30	19.69	29
30	22.29	20.07	22.21	20.17	22.12	20.27	22.03	20.36	30
31	23.04	20.74	22.95	20.84	22.86	20.94	22.76	21.04	31
32	23.78	21.41	23.69	21.52	23.59	21.62	23.50	21.72	32
33	24.52	22.08	24.43	22.19	24.33	22.29	24.23	22.40	33
34	25.27	22.75	25.17	22.86	25.07	22.97	24.97	23.08	34
35	26.01	23.42	25.91	23.53	25.80	23.65	25.70	23.76	35
36	26.75	24.09	26.65	24.21	26.54	24.32	26.44	24.44	36
37	27.50	24.76	27.39	24.88	27.28	25.00	27.17	25.12	37
38	28.24	25.43	28.13	25.55	28.02	25.67	27.90	25.79	38
39	28.98	26.10	28.87	26.22	28.75	26.35	28.64	26.47	39
40	29.73	26.77	29.61	26.89	29.49	27.02	29.37	27.15	40
41	30.47	27.43	30.35	27.57	30.23	27.70	30.11	27.83	41
42	31.21	28.10	31.09	28.24	30.97	28.37	30.84	28.51	42
43	31.96	28.77	31.83	28.91	31.70	29.05	31.58	29.19	43
44	32.70	29.44	32.57	29.58	32.44	29.73	32.31	29.87	44
45	33.44	30.11	33.31	30.26	33.18	30.40	33.04	30.55	45
46	34.18	30.78	34.05	30.93	33.91	31.08	33.78	31.22	46
47	34.93	31.45	34.79	31.60	34.65	31.75	34.51	31.90	47
48	35.67	32.12	35.53	32.27	35.39	32.43	35.25	32.58	48
49	36.41	32.79	36.27	32.95	36.13	33.10	35.98	33.26	49
50	37.16	33.46	37.01	33.62	36.86	33.78	36.72	33.94	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	48°.		47¾°.		47½°.		47¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	42°.		42¼°.		42½°.		42¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	37.90	34.13	37.75	34.29	37.60	34.46	37.45	34.62	51
52	38.64	34.79	38.49	34.96	38.34	35.13	38.18	35.30	52
53	39.39	35.46	39.23	35.64	39.08	35.81	38.92	35.98	53
54	40.13	36.13	39.97	36.31	39.81	36.48	39.65	36.66	54
55	40.87	36.80	40.71	36.98	40.55	37.16	40.39	37.33	55
56	41.62	37.47	41.45	37.65	41.29	37.83	41.12	38.01	56
57	42.36	38.14	42.19	38.32	42.02	38.51	41.86	38.69	57
58	43.10	38.81	42.93	39.00	42.76	39.18	42.59	39.37	58
59	43.85	39.48	43.67	39.67	43.50	39.86	43.33	40.05	59
60	44.59	40.15	44.41	40.34	44.24	40.54	44.06	40.73	60
61	45.33	40.82	45.15	41.01	44.97	41.21	44.79	41.41	61
62	46.07	41.49	45.89	41.69	45.71	41.89	45.53	42.09	62
63	46.82	42.16	46.63	42.36	46.45	42.56	46.26	42.76	63
64	47.56	42.82	47.37	43.03	47.19	43.24	47.00	43.44	64
65	48.30	43.49	48.11	43.70	47.92	43.91	47.73	44.12	65
66	49.05	44.16	48.85	44.38	48.66	44.59	48.47	44.80	66
67	49.79	44.83	49.59	45.05	49.40	45.26	49.20	45.48	67
68	50.53	45.50	50.33	45.72	50.13	45.94	49.93	46.16	68
69	51.28	46.17	51.08	46.39	50.87	46.62	50.67	46.84	69
70	52.02	46.84	51.82	47.07	51.61	47.29	51.40	47.52	70
71	52.76	47.51	52.56	47.74	52.35	47.97	52.14	48.19	71
72	53.51	48.18	53.30	48.41	53.08	48.64	52.87	48.87	72
73	54.25	48.85	54.04	49.08	53.82	49.32	53.61	49.55	73
74	54.99	49.52	54.78	49.76	54.56	49.99	54.34	50.23	74
75	55.74	50.18	55.52	50.43	55.30	50.67	55.07	50.91	75
76	56.48	50.85	56.26	51.10	56.03	51.34	55.81	51.59	76
77	57.22	51.52	57.00	51.77	56.77	52.02	56.54	52.27	77
78	57.97	52.19	57.74	52.44	57.51	52.70	57.28	52.95	78
79	58.71	52.86	58.48	53.12	58.24	53.37	58.01	53.63	79
80	59.45	53.53	59.22	53.79	58.98	54.05	58.75	54.30	80
81	60.19	54.20	59.96	54.46	59.72	54.72	59.48	54.98	81
82	60.94	54.87	60.70	55.13	60.46	55.40	60.21	55.66	82
83	61.68	55.54	61.44	55.81	61.19	56.07	60.95	56.34	83
84	62.42	56.21	62.18	56.48	61.93	56.75	61.68	57.02	84
85	63.17	56.88	62.92	57.15	62.67	57.43	62.42	57.70	85
86	63.91	57.55	63.66	57.82	63.41	58.10	63.15	58.38	86
87	64.65	58.21	64.40	58.50	64.14	58.78	63.89	59.06	87
88	65.40	58.88	65.14	59.17	64.88	59.45	64.62	59.73	88
89	66.14	59.55	65.88	59.84	65.62	60.13	65.35	60.41	89
90	66.88	60.22	66.62	60.51	66.35	60.80	66.09	61.09	90
91	67.63	60.89	67.36	61.19	67.09	61.48	66.82	61.77	91
92	68.37	61.56	68.10	61.86	67.83	62.15	67.56	62.45	92
93	69.11	62.23	68.84	62.53	68.57	62.83	68.29	63.13	93
94	69.86	62.90	69.58	63.20	69.30	63.51	69.03	63.81	94
95	70.60	63.57	70.32	63.87	70.04	64.18	69.76	64.49	95
96	71.34	64.24	71.06	64.55	70.78	64.86	70.49	65.16	96
97	72.09	64.91	71.80	65.22	71.52	65.53	71.23	65.84	97
98	72.83	65.57	72.54	65.89	72.25	66.21	71.96	66.52	98
99	73.57	66.24	73.28	66.56	72.99	66.88	72.70	67.20	99
100	74.31	66.91	74.02	67.24	73.73	67.56	73.43	67.88	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	48°.		47¾°.		47½°.		47¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	43°.		43¼°.		43½°.		43¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.73	0.68	0.73	0.69	0.73	0.69	0.72	0.69	1
2	1.46	1.36	1.46	1.37	1.45	1.38	1.44	1.38	2
3	2.19	2.05	2.19	2.06	2.18	2.07	2.17	2.07	3
4	2.93	2.73	2.91	2.74	2.90	2.75	2.89	2.77	4
5	3.66	3.41	3.64	3.43	3.63	3.44	3.61	3.46	5
6	4.39	4.09	4.37	4.11	4.35	4.13	4.33	4.15	6
7	5.12	4.77	5.10	4.80	5.08	4.82	5.06	4.84	7
8	5.85	5.46	5.83	5.48	5.80	5.51	5.78	5.53	8
9	6.58	6.14	6.56	6.17	6.53	6.20	6.50	6.22	9
10	7.31	6.82	7.28	6.85	7.25	6.88	7.22	6.92	10
11	8.04	7.50	8.01	7.54	7.98	7.57	7.95	7.61	11
12	8.78	8.18	8.74	8.22	8.70	8.26	8.67	8.30	12
13	9.51	8.87	9.47	8.91	9.43	8.95	9.39	8.99	13
14	10.24	9.55	10.20	9.59	10.16	9.64	10.11	9.68	14
15	10.97	10.23	10.93	10.28	10.88	10.33	10.84	10.37	15
16	11.70	10.91	11.65	10.96	11.61	11.01	11.56	11.06	16
17	12.43	11.59	12.38	11.65	12.33	11.70	12.28	11.76	17
18	13.16	12.28	13.11	12.33	13.06	12.39	13.00	12.45	18
19	13.90	12.96	13.84	13.02	13.78	13.08	13.72	13.14	19
20	14.63	13.64	14.57	13.70	14.51	13.77	14.45	13.83	20
21	15.36	14.32	15.30	14.39	15.23	14.46	15.17	14.52	21
22	16.09	15.00	16.02	15.07	15.96	15.14	15.89	15.21	22
23	16.82	15.69	16.75	15.76	16.68	15.83	16.61	15.90	23
24	17.55	16.37	17.48	16.44	17.41	16.52	17.34	16.60	24
25	18.28	17.05	18.21	17.13	18.13	17.21	18.06	17.29	25
26	19.02	17.73	18.94	17.81	18.86	17.90	18.78	17.98	26
27	19.75	18.41	19.67	18.50	19.59	18.59	19.50	18.67	27
28	20.48	19.10	20.39	19.19	20.31	19.27	20.23	19.36	28
29	21.21	19.78	21.12	19.87	21.04	19.96	20.95	20.05	29
30	21.94	20.46	21.85	20.56	21.76	20.65	21.67	20.75	30
31	22.67	21.14	22.58	21.24	22.49	21.34	22.39	21.44	31
32	23.40	21.82	23.31	21.93	23.21	22.03	23.12	22.13	32
33	24.13	22.51	24.04	22.61	23.94	22.72	23.84	22.82	33
34	24.87	23.19	24.76	23.30	24.66	23.40	24.56	23.51	34
35	25.60	23.87	25.49	23.98	25.39	24.09	25.28	24.20	35
36	26.33	24.55	26.22	24.67	26.11	24.78	26.01	24.89	36
37	27.06	25.23	26.95	25.35	26.84	25.47	26.73	25.59	37
38	27.79	25.92	27.68	26.04	27.56	26.16	27.45	26.28	38
39	28.52	26.60	28.41	26.72	28.29	26.85	28.17	26.97	39
40	29.25	27.28	29.13	27.41	29.01	27.53	28.89	27.66	40
41	29.99	27.96	29.86	28.09	29.74	28.22	29.62	28.35	41
42	30.72	28.64	30.59	28.78	30.47	28.91	30.34	29.04	42
43	31.45	29.33	31.32	29.46	31.19	29.60	31.06	29.74	43
44	32.18	30.01	32.05	30.15	31.92	30.29	31.78	30.43	44
45	32.91	30.69	32.78	30.83	32.64	30.98	32.51	31.12	45
46	33.64	31.37	33.51	31.52	33.37	31.66	33.23	31.81	46
47	34.37	32.05	34.23	32.20	34.09	32.35	33.95	32.50	47
48	35.10	32.74	34.96	32.89	34.82	33.04	34.67	33.19	48
49	35.84	33.42	35.69	33.57	35.54	33.73	35.40	33.88	49
50	36.57	34.10	36.42	34.26	36.27	34.42	36.12	34.58	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	47°.		46¾°.		46½°.		46¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	43°.		43¼°.		43½°.		43¾°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	37.30	34.78	37.15	34.94	36.99	35.11	36.84	35.27	51
52	38.03	35.46	37.88	35.63	37.72	35.79	37.56	35.96	52
53	38.76	36.15	38.60	36.31	38.44	36.48	38.29	36.65	53
54	39.49	36.83	39.33	37.00	39.17	37.17	39.01	37.34	54
55	40.22	37.51	40.06	37.69	39.90	37.86	39.73	38.03	55
56	40.96	38.19	40.79	38.37	40.62	38.55	40.45	38.72	56
57	41.69	38.87	41.52	39.06	41.35	39.24	41.17	39.42	57
58	42.42	39.56	42.25	39.74	42.07	39.92	41.90	40.11	58
59	43.15	40.24	42.97	40.43	42.80	40.61	42.62	40.80	59
60	43.88	40.92	43.70	41.11	43.52	41.30	43.34	41.49	60
61	44.61	41.60	44.43	41.80	44.25	41.99	44.06	42.18	61
62	45.34	42.28	45.16	42.48	44.97	42.68	44.79	42.87	62
63	46.08	42.97	45.89	43.17	45.70	43.37	45.51	43.57	63
64	46.81	43.65	46.62	43.85	46.42	44.05	46.23	44.26	64
65	47.54	44.33	47.34	44.54	47.15	44.74	46.95	44.95	65
66	48.27	45.01	48.07	45.22	47.87	45.43	47.68	45.64	66
67	49.00	45.69	48.80	45.91	48.60	46.12	48.40	46.33	67
68	49.73	46.38	49.53	46.59	49.33	46.81	49.12	47.02	68
69	50.46	47.06	50.26	47.28	50.05	47.50	49.84	47.71	69
70	51.19	47.74	50.99	47.96	50.78	48.18	50.57	48.41	70
71	51.93	48.42	51.71	48.65	51.50	48.87	51.29	49.10	71
72	52.66	49.10	52.44	49.33	52.23	49.56	52.01	49.79	72
73	53.39	49.79	53.17	50.02	52.95	50.25	52.73	50.48	73
74	54.12	50.47	53.90	50.70	53.68	50.94	53.45	51.17	74
75	54.85	51.15	54.63	51.39	54.40	51.63	54.18	51.86	75
76	55.58	51.83	55.36	52.07	55.13	52.31	54.90	52.55	76
77	56.31	52.51	56.08	52.76	55.85	53.00	55.62	53.25	77
78	57.05	53.20	56.81	53.44	56.58	53.69	56.34	53.94	78
79	57.78	53.88	57.54	54.13	57.30	54.38	57.07	54.63	79
80	58.51	54.56	58.27	54.81	58.03	55.07	57.79	55.32	80
81	59.24	55.24	59.00	55.50	58.76	55.76	58.51	56.01	81
82	59.97	55.92	59.73	56.19	59.48	56.45	59.23	56.70	82
83	60.70	56.61	60.45	56.87	60.21	57.13	59.96	57.40	83
84	61.43	57.29	61.18	57.56	60.93	57.82	60.68	58.09	84
85	62.17	57.97	61.91	58.24	61.66	58.51	61.40	58.78	85
86	62.90	58.65	62.64	58.93	62.38	59.20	62.12	59.47	86
87	63.63	59.33	63.37	59.61	63.11	59.89	62.85	60.16	87
88	64.36	60.02	64.10	60.30	63.83	60.58	63.57	60.85	88
89	65.09	60.70	64.82	60.98	64.56	61.26	64.29	61.54	89
90	65.82	61.38	65.55	61.67	65.28	61.95	65.01	62.24	90
91	66.55	62.06	66.28	62.35	66.01	62.64	65.74	62.93	91
92	67.28	62.74	67.01	63.04	66.73	63.33	66.46	63.62	92
93	68.02	63.43	67.74	63.72	67.46	64.02	67.18	64.31	93
94	68.75	64.11	68.47	64.41	68.19	64.71	67.90	65.00	94
95	69.48	64.79	69.20	65.09	68.91	65.39	68.62	65.69	95
96	70.21	65.47	69.92	65.78	69.64	66.08	69.35	66.39	96
97	70.94	66.15	70.65	66.46	70.36	66.77	70.07	67.08	97
98	71.67	66.84	71.38	67.15	71.09	67.46	70.79	67.77	98
99	72.40	67.52	72.11	67.83	71.81	68.15	71.51	68.46	99
100	73.14	68.20	72.84	68.52	72.54	68.84	72.24	69.15	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	47°.		46¾°.		46½°.		46¼°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	44°.		44¼°.		44½°.		44¾°.		45°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
1	0.72	0.69	0.72	0.70	0.71	0.70	0.71	0.70	0.71	0.71	1
2	1.44	1.39	1.43	1.40	1.43	1.40	1.42	1.41	1.41	1.41	2
3	2.16	2.08	2.15	2.09	2.14	2.10	2.13	2.11	2.12	2.12	3
4	2.88	2.78	2.87	2.79	2.85	2.80	2.84	2.82	2.83	2.83	4
5	3.60	3.47	3.58	3.49	3.57	3.50	3.55	3.52	3.54	3.54	5
6	4.32	4.17	4.30	4.19	4.28	4.21	4.26	4.22	4.24	4.24	6
7	5.04	4.86	5.01	4.88	4.99	4.91	4.97	4.93	4.95	4.95	7
8	5.75	5.56	5.73	5.58	5.71	5.61	5.68	5.63	5.66	5.66	8
9	6.47	6.25	6.45	6.28	6.42	6.31	6.39	6.34	6.36	6.36	9
10	7.19	6.95	7.16	6.98	7.13	7.01	7.10	7.04	7.07	7.07	10
11	7.91	7.64	7.88	7.68	7.85	7.71	7.81	7.74	7.78	7.78	11
12	8.63	8.34	8.60	8.37	8.56	8.41	8.52	8.45	8.49	8.49	12
13	9.35	9.03	9.31	9.07	9.27	9.11	9.23	9.15	9.19	9.19	13
14	10.07	9.73	10.03	9.77	9.99	9.81	9.94	9.86	9.90	9.90	14
15	10.79	10.42	10.74	10.47	10.70	10.51	10.65	10.56	10.61	10.61	15
16	11.51	11.11	11.46	11.16	11.41	11.21	11.36	11.26	11.31	11.31	16
17	12.23	11.81	12.18	11.86	12.13	11.92	12.07	11.97	12.02	12.02	17
18	12.95	12.50	12.89	12.56	12.84	12.62	12.78	12.67	12.73	12.73	18
19	13.67	13.20	13.61	13.26	13.55	13.32	13.49	13.38	13.44	13.44	19
20	14.39	13.89	14.33	13.96	14.27	14.02	14.20	14.08	14.14	14.14	20
21	15.11	14.59	15.04	14.65	14.98	14.72	14.91	14.78	14.85	14.85	21
22	15.83	15.28	15.76	15.35	15.69	15.42	15.62	15.49	15.56	15.56	22
23	16.54	15.98	16.47	16.05	16.40	16.12	16.33	16.19	16.26	16.26	23
24	17.26	16.67	17.19	16.75	17.12	16.82	17.04	16.90	16.97	16.97	24
25	17.98	17.37	17.91	17.44	17.83	17.52	17.75	17.60	17.68	17.68	25
26	18.70	18.06	18.62	18.14	18.54	18.22	18.46	18.30	18.38	18.38	26
27	19.42	18.76	19.34	18.84	19.26	18.92	19.18	19.01	19.09	19.09	27
28	20.14	19.45	20.06	19.54	19.97	19.63	19.89	19.71	19.80	19.80	28
29	20.86	20.15	20.77	20.24	20.68	20.33	20.60	20.42	20.51	20.51	29
30	21.58	20.84	21.49	20.93	21.40	21.03	21.31	21.12	21.21	21.21	30
31	22.30	21.53	22.21	21.63	22.11	21.73	22.02	21.82	21.92	21.92	31
32	23.02	22.23	22.92	22.33	22.82	22.43	22.73	22.53	22.63	22.63	32
33	23.74	22.92	23.64	23.03	23.54	23.13	23.44	23.23	23.33	23.33	33
34	24.46	23.62	24.35	23.72	24.25	23.83	24.15	23.94	24.04	24.04	34
35	25.18	24.31	25.07	24.42	24.96	24.53	24.86	24.64	24.75	24.75	35
36	25.90	25.01	25.79	25.12	25.68	25.23	25.57	25.34	25.46	25.46	36
37	26.62	25.70	26.50	25.82	26.39	25.93	26.28	26.05	26.16	26.16	37
38	27.33	26.40	27.22	26.52	27.10	26.63	26.99	26.75	26.87	26.87	38
39	28.05	27.09	27.94	27.21	27.82	27.34	27.70	27.46	27.58	27.58	39
40	28.77	27.79	28.65	27.91	28.53	28.04	28.41	28.16	28.28	28.28	40
41	29.49	28.48	29.37	28.61	29.24	28.74	29.12	28.86	28.99	28.99	41
42	30.21	29.18	30.08	29.31	29.96	29.44	29.83	29.57	29.70	29.70	42
43	30.93	29.87	30.80	30.00	30.67	30.14	30.54	30.27	30.41	30.41	43
44	31.65	30.56	31.52	30.70	31.38	30.84	31.25	30.98	31.11	31.11	44
45	32.37	31.26	32.23	31.40	32.10	31.54	31.96	31.68	31.82	31.82	45
46	33.09	31.95	32.95	32.10	32.81	32.24	32.67	32.38	32.53	32.53	46
47	33.81	32.65	33.67	32.80	33.52	32.94	33.38	33.09	33.23	33.23	47
48	34.53	33.34	34.38	33.49	34.24	33.64	34.09	33.79	33.94	33.94	48
49	35.25	34.04	35.10	34.19	34.95	34.34	34.80	34.50	34.65	34.65	49
50	35.97	34.73	35.82	34.89	35.66	35.05	35.51	35.20	35.36	35.36	50
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	46°.		45¾°.		45½°.		45¼°.		45°.		

TABLE 4.—TRAVERSE TABLE.

Distance.	44°.		44¼°.		44½°.		44¾°.		45°.		Distance.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
51	36.69	35.43	36.53	35.59	36.38	35.75	36.22	35.90	36.06	36.06	51
52	37.41	36.12	37.25	36.29	37.09	36.45	36.93	36.61	36.77	36.77	52
53	38.13	36.82	37.96	36.98	37.80	37.15	37.64	37.31	37.48	37.48	53
54	38.84	37.51	38.68	37.68	38.52	37.85	38.35	38.02	38.18	38.18	54
55	39.56	38.21	39.40	38.38	39.23	38.55	39.06	38.72	38.89	38.89	55
56	40.28	38.90	40.11	39.08	39.94	39.25	39.77	39.42	39.60	39.60	56
57	41.00	39.60	40.83	39.77	40.66	39.95	40.48	40.13	40.31	40.31	57
58	41.72	40.29	41.55	40.47	41.37	40.65	41.19	40.83	41.01	41.01	58
59	42.44	40.98	42.26	41.17	42.08	41.35	41.90	41.54	41.72	41.72	59
60	43.16	41.68	42.98	41.87	42.80	42.05	42.61	42.24	42.43	42.43	60
61	43.88	42.37	43.69	42.57	43.51	42.76	43.32	42.94	43.13	43.13	61
62	44.60	43.07	44.41	43.26	44.22	43.46	44.03	43.65	43.84	43.84	62
63	45.32	43.76	45.13	43.96	44.93	44.16	44.74	44.35	44.55	44.55	63
64	46.04	44.46	45.84	44.66	45.65	44.86	45.45	45.06	45.25	45.25	64
65	46.76	45.15	46.56	45.36	46.36	45.56	46.16	45.76	45.96	45.96	65
66	47.48	45.85	47.28	46.05	47.07	46.26	46.87	46.46	46.67	46.67	66
67	48.20	46.54	47.99	46.75	47.79	46.96	47.58	47.17	47.38	47.38	67
68	48.92	47.24	48.71	47.45	48.50	47.66	48.29	47.87	48.08	48.08	68
69	49.63	47.93	49.42	48.15	49.21	48.36	49.00	48.58	48.79	48.79	69
70	50.35	48.63	50.14	48.85	49.93	49.06	49.71	49.28	49.50	49.50	70
71	51.07	49.32	50.86	49.54	50.64	49.76	50.42	49.99	50.20	50.20	71
72	51.79	50.02	51.57	50.24	51.35	50.47	51.13	50.69	50.91	50.91	72
73	52.51	50.71	52.29	50.94	52.07	51.17	51.84	51.39	51.62	51.62	73
74	53.23	51.40	53.01	51.64	52.78	51.87	52.55	52.10	52.33	52.33	74
75	53.95	52.10	53.72	52.33	53.49	52.57	53.26	52.80	53.03	53.03	75
76	54.67	52.79	54.44	53.03	54.21	53.27	53.97	53.51	53.74	53.74	76
77	55.39	53.49	55.16	53.73	54.92	53.97	54.68	54.21	54.45	54.45	77
78	56.11	54.18	55.87	54.43	55.63	54.67	55.39	54.91	55.15	55.15	78
79	56.83	54.88	56.59	55.13	56.35	55.37	56.10	55.62	55.86	55.86	79
80	57.55	55.57	57.30	55.82	57.06	56.07	56.81	56.32	56.57	56.57	80
81	58.27	56.27	58.02	56.52	57.77	56.77	57.53	57.03	57.28	57.28	81
82	58.99	56.96	58.74	57.22	58.49	57.47	58.24	57.73	57.98	57.98	82
83	59.71	57.66	59.45	57.92	59.20	58.18	58.95	58.43	58.69	58.69	83
84	60.42	58.35	60.17	58.61	59.91	58.88	59.66	59.14	59.40	59.40	84
85	61.14	59.05	60.89	59.31	60.63	59.58	60.37	59.84	60.10	60.10	85
86	61.86	59.74	61.60	60.01	61.34	60.28	61.08	60.55	60.81	60.81	86
87	62.58	60.44	62.32	60.71	62.05	60.98	61.79	61.25	61.52	61.52	87
88	63.30	61.13	63.03	61.41	62.77	61.68	62.50	61.95	62.23	62.23	88
89	64.02	61.82	63.75	62.10	63.48	62.38	63.21	62.66	62.93	62.93	89
90	64.74	62.52	64.47	62.80	64.19	63.08	63.92	63.36	63.64	63.64	90
91	65.46	63.21	65.18	63.50	64.91	63.78	64.63	64.07	64.35	64.35	91
92	66.18	63.91	65.90	64.20	65.62	64.48	65.34	64.77	65.05	65.05	92
93	66.90	64.60	66.62	64.89	66.33	65.18	66.05	65.47	65.76	65.76	93
94	67.62	65.30	67.33	65.59	67.05	65.89	66.76	66.18	66.47	66.47	94
95	68.34	65.99	68.05	66.29	67.76	66.59	67.47	66.88	67.18	67.18	95
96	69.06	66.69	68.76	66.99	68.47	67.29	68.18	67.59	67.88	67.88	96
97	69.78	67.38	69.48	67.69	69.19	67.99	68.89	68.29	68.59	68.59	97
98	70.50	68.08	70.20	68.38	69.90	68.69	69.60	68.99	69.30	69.30	98
99	71.21	68.77	70.91	69.08	70.61	69.39	70.31	69.70	70.00	70.00	99
100	71.93	69.47	71.63	69.78	71.33	70.09	71.02	70.40	70.71	70.71	100
Distance.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Distance.
	46°.		45¾°.		45½°.		45¼°.		45°.		

TABLE 5.—CORRECTION OF ERROR IN STADIA WIRE INTERVAL.

Distance in chains.										
0	1	2	3	4	5	6	7	8	9	10
Error in Links.										
0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
0.0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0
0.0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
0.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
0.0	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0
0.0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0
0.0	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0
0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
0.0	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11.0
0.0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
0.0	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0
0.0	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0
0.0	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
0.0	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	16.0
0.0	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	17.0
0.0	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0
0.0	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1	19.0
0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
0.0	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	21.0
0.0	2.2	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	22.0
0.0	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	23.0
0.0	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0
0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0
0.0	2.6	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4	26.0
0.0	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	27.0
0.0	2.8	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	28.0
0.0	2.9	5.8	8.7	11.6	14.5	17.4	20.3	23.2	26.1	29.0
0.0	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0

Distance in chains.										
10	11	12	13	14	15	16	17	18	19	20
Error in links.										
1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0
4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0
5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0
7.0	7.7	8.4	9.1	9.8	10.5	11.2	11.9	12.6	13.3	14.0
8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0
9.0	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0
10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
11.0	12.1	13.2	14.3	15.4	16.5	17.6	18.7	19.8	20.9	22.0
12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24.0
13.0	14.3	15.6	16.9	18.2	19.5	20.8	22.1	23.4	24.7	26.0
14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	26.6	28.0
15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0
16.0	17.6	19.2	20.8	22.4	24.0	25.6	27.2	28.8	30.4	32.0
17.0	18.7	20.4	22.1	23.8	25.5	27.2	28.9	30.6	32.3	34.0
18.0	19.8	21.6	23.4	25.2	27.0	28.8	30.6	32.4	34.2	36.0
19.0	20.9	22.8	24.7	26.6	28.5	30.4	32.3	34.2	36.1	38.0
20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	38.0	40.0
21.0	23.1	25.2	27.3	29.4	31.5	33.6	35.7	37.8	39.9	42.0
22.0	24.2	26.4	28.6	30.8	33.0	35.2	37.4	39.6	41.8	44.0
23.0	25.3	27.6	29.9	32.2	34.5	36.8	39.1	41.4	43.7	46.0
24.0	26.4	28.8	31.2	33.6	36.0	38.4	40.8	43.2	45.6	48.0
25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5	45.0	47.5	50.0
26.0	28.6	31.2	33.8	36.4	39.0	41.6	44.2	46.8	49.4	52.0
27.0	29.7	32.4	35.1	37.8	40.5	43.2	45.9	48.6	51.3	54.0
28.0	30.8	33.6	36.4	39.2	42.0	44.8	47.6	50.4	53.2	56.0
29.0	31.9	34.8	37.7	40.6	43.5	46.4	49.3	52.2	55.1	58.0
30.0	33.0	36.0	39.0	42.0	45.0	48.0	51.0	54.0	57.0	60.0

TABLE 6.—STADIA COEFFICIENTS, VERTICAL ROD.

$\cos^2 v$ and $\frac{1}{2} \sin 2v$.

	0°		1°		2°		3°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	1.0000	.0000	.9997	.0174	.9988	.0349	.9973	.0523
2	1.0000	.0006	.9997	.0180	.9987	.0355	.9972	.0528
4	1.0000	.0012	.9997	.0186	.9987	.0360	.9971	.0534
6	1.0000	.0017	.9996	.0192	.9987	.0366	.9971	.0540
8	1.0000	.0023	.9996	.0198	.9986	.0372	.9970	.0546
10	1.0000	.0029	.9996	.0204	.9986	.0378	.9969	.0552
12	1.0000	.0035	.9996	.0209	.9985	.0384	.9969	.0557
14	1.0000	.0041	.9995	.0215	.9985	.0390	.9968	.0563
16	1.0000	.0047	.9995	.0221	.9984	.0395	.9968	.0569
18	1.0000	.0052	.9995	.0227	.9984	.0401	.9967	.0575
20	1.0000	.0058	.9995	.0233	.9983	.0407	.9966	.0580
22	1.0000	.0064	.9994	.0238	.9983	.0413	.9966	.0586
24	1.0000	.0070	.9994	.0244	.9982	.0418	.9965	.0592
26	.9999	.0076	.9994	.0250	.9982	.0424	.9964	.0598
28	.9999	.0081	.9993	.0256	.9981	.0430	.9963	.0604
30	.9999	.0087	.9993	.0262	.9981	.0436	.9963	.0609
32	.9999	.0093	.9993	.0267	.9980	.0442	.9962	.0615
34	.9999	.0099	.9993	.0273	.9980	.0448	.9962	.0621
36	.9999	.0105	.9992	.0279	.9979	.0453	.9961	.0627
38	.9999	.0111	.9992	.0285	.9979	.0459	.9960	.0633
40	.9999	.0116	.9992	.0291	.9978	.0465	.9959	.0638
42	.9999	.0122	.9991	.0297	.9978	.0471	.9959	.0644
44	.9998	.0128	.9991	.0302	.9977	.0476	.9958	.0650
46	.9998	.0134	.9990	.0308	.9977	.0482	.9957	.0656
48	.9998	.0140	.9990	.0314	.9976	.0488	.9956	.0661
50	.9998	.0145	.9990	.0320	.9976	.0494	.9956	.0667
52	.9998	.0151	.9989	.0326	.9975	.0499	.9955	.0673
54	.9998	.0157	.9989	.0331	.9974	.0505	.9954	.0678
56	.9997	.0163	.9989	.0337	.9974	.0511	.9953	.0684
58	.9997	.0169	.9988	.0343	.9973	.0517	.9952	.0690
60	.9997	.0174	.9988	.0349	.9973	.0523	.9951	.0696
$c+f$								
0.75	0.75	0.01	0.75	0.02	0.75	0.03	0.75	0.05
1.00	1.00	0.01	1.00	0.03	1.00	0.04	1.00	0.06
1.25	1.25	0.02	1.25	0.03	1.25	0.05	1.25	0.08

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions

TABLE 6.—STADIA COEFFICIENTS, VERTICAL ROD.

$\text{Cos}^2 v$ and $\frac{1}{2} \sin 2v$.

	4°		5°		6°		7°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	.9951	.0696	.9924	.0868	.9891	.1040	.9851	.1210
2	.9951	.0702	.9923	.0874	.9890	.1045	.9850	.1215
4	.9950	.0707	.9922	.0880	.9888	.1051	.9848	.1221
6	.9949	.0713	.9921	.0885	.9887	.1057	.9847	.1226
8	.9948	.0719	.9920	.0891	.9886	.1062	.9846	.1232
10	.9947	.0725	.9919	.0897	.9885	.1068	.9844	.1238
12	.9946	.0730	.9918	.0903	.9883	.1074	.9843	.1243
14	.9946	.0736	.9917	.0908	.9882	.1079	.9841	.1249
16	.9945	.0742	.9916	.0914	.9881	.1085	.9840	.1255
18	.9944	.0748	.9915	.0920	.9880	.1091	.9839	.1260
20	.9943	.0753	.9914	.0925	.9878	.1096	.9837	.1266
22	.9942	.0759	.9913	.0931	.9877	.1102	.9836	.1272
24	.9941	.0765	.9911	.0937	.9876	.1108	.9834	.1277
26	.9940	.0771	.9910	.0943	.9874	.1113	.9833	.1283
28	.9939	.0776	.9909	.0948	.9873	.1119	.9831	.1288
30	.9938	.0782	.9908	.0954	.9872	.1125	.9829	.1294
32	.9938	.0788	.9907	.0960	.9871	.1130	.9828	.1300
34	.9937	.0794	.9906	.0965	.9869	.1136	.9827	.1305
36	.9936	.0799	.9905	.0971	.9868	.1142	.9825	.1311
38	.9935	.0805	.9904	.0977	.9867	.1147	.9824	.1317
40	.9934	.0811	.9903	.0983	.9865	.1153	.9822	.1322
42	.9933	.0817	.9901	.0988	.9864	.1159	.9820	.1328
44	.9932	.0822	.9900	.0994	.9863	.1164	.9819	.1333
46	.9931	.0828	.9899	.1000	.9861	.1170	.9817	.1339
48	.9930	.0834	.9898	.1005	.9860	.1176	.9816	.1345
50	.9929	.0840	.9897	.1011	.9858	.1181	.9814	.1350
52	.9928	.0845	.9896	.1017	.9857	.1187	.9813	.1356
54	.9927	.0851	.9894	.1022	.9856	.1193	.9811	.1361
56	.9926	.0857	.9893	.1028	.9854	.1198	.9810	.1367
58	.9925	.0863	.9892	.1034	.9853	.1204	.9808	.1373
60	.9924	.0868	.9891	.1040	.9851	.1210	.9806	.1378
$c+f$								
0.75	0.75	0.06	0.75	0.07	0.75	0.08	0.74	0.10
1.00	1.00	0.08	0.99	0.09	0.99	0.11	0.99	0.13
1.25	1.25	0.10	1.24	0.11	1.24	0.14	1.24	0.16

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions.

TABLE 6.—STADIA COEFFICIENTS, VERTICAL ROD.

$\text{Cos}^2 v$ and $\frac{1}{2} \sin 2v$.

	8°		9°		10°		11°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	.9806	.1378	.9755	.1545	.9698	.1710	.9636	.1873
2	.9805	.1384	.9753	.1551	.9696	.1716	.9634	.1878
4	.9803	.1389	.9752	.1556	.9694	.1721	.9632	.1884
6	.9801	.1395	.9750	.1562	.9692	.1726	.9629	.1889
8	.9800	.1401	.9748	.1567	.9690	.1732	.9627	.1895
10	.9798	.1406	.9746	.1573	.9688	.1737	.9625	.1900
12	.9797	.1412	.9744	.1578	.9686	.1743	.9623	.1905
14	.9795	.1417	.9743	.1584	.9684	.1748	.9621	.1911
16	.9793	.1423	.9741	.1589	.9682	.1754	.9618	.1916
18	.9792	.1428	.9739	.1595	.9680	.1759	.9616	.1921
20	.9790	.1434	.9737	.1600	.9678	.1765	.9614	.1927
22	.9788	.1440	.9735	.1606	.9676	.1770	.9612	.1932
24	.9787	.1445	.9733	.1611	.9674	.1776	.9609	.1938
26	.9785	.1451	.9731	.1617	.9672	.1781	.9607	.1943
28	.9783	.1456	.9729	.1622	.9670	.1786	.9605	.1948
30	.9782	.1462	.9728	.1628	.9668	.1792	.9603	.1954
32	.9780	.1467	.9726	.1633	.9666	.1797	.9600	.1959
34	.9778	.1473	.9724	.1639	.9664	.1803	.9598	.1964
36	.9776	.1479	.9722	.1644	.9662	.1808	.9596	.1970
38	.9775	.1484	.9720	.1650	.9660	.1814	.9593	.1975
40	.9773	.1490	.9718	.1655	.9657	.1819	.9591	.1980
42	.9771	.1495	.9716	.1661	.9655	.1824	.9589	.1986
44	.9769	.1501	.9714	.1666	.9653	.1830	.9586	.1991
46	.9768	.1506	.9712	.1672	.9651	.1835	.9584	.1996
48	.9766	.1512	.9710	.1677	.9649	.1841	.9582	.2002
50	.9764	.1517	.9708	.1683	.9647	.1846	.9579	.2007
52	.9762	.1523	.9706	.1688	.9645	.1851	.9577	.2012
54	.9761	.1528	.9704	.1694	.9642	.1857	.9575	.2018
56	.9759	.1534	.9702	.1699	.9640	.1862	.9572	.2023
58	.9757	.1540	.9700	.1705	.9638	.1868	.9570	.2028
60	.9755	.1545	.9698	.1710	.9636	.1873	.9568	.2034
$c+f$								
0.75	0.74	0.11	0.74	0.12	0.74	0.14	0.73	0.15
1.00	0.99	0.15	0.99	0.16	0.98	0.18	0.98	0.20
1.25	1.23	0.18	1.23	0.21	1.23	0.23	1.22	0.25

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions.

TABLE 6.–STADIA COEFFICIENTS, VERTICAL ROD.

$\text{Cos}^2 v$ and $\frac{1}{2} \sin 2v$.

	12°		13°		14°		15°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	.9568	.2034	.9494	.2192	.9415	.2347	.9330	.2500
2	.9565	.2039	.9491	.2197	.9412	.2352	.9327	.2505
4	.9563	.2044	.9489	.2202	.9409	.2358	.9324	.2510
6	.9561	.2050	.9486	.2208	.9407	.2363	.9321	.2515
8	.9558	.2055	.9484	.2213	.9404	.2368	.9318	.2520
10	.9556	.2060	.9481	.2218	.9401	.2373	.9316	.2525
12	.9553	.2066	.9479	.2223	.9398	.2378	.9313	.2530
14	.9551	.2071	.9476	.2228	.9395	.2383	.9310	.2535
16	.9549	.2076	.9473	.2234	.9393	.2388	.9307	.2540
18	.9546	.2081	.9471	.2239	.9390	.2393	.9304	.2545
20	.9544	.2087	.9468	.2244	.9387	.2399	.9301	.2550
22	.9541	.2092	.9466	.2249	.9384	.2404	.9298	.2555
24	.9539	.2097	.9463	.2254	.9381	.2409	.9295	.2560
26	.9536	.2103	.9460	.2260	.9379	.2414	.9292	.2565
28	.9534	.2108	.9458	.2265	.9376	.2419	.9289	.2570
30	.9532	.2113	.9455	.2270	.9373	.2424	.9286	.2575
32	.9529	.2118	.9452	.2275	.9370	.2429	.9283	.2580
34	.9527	.2124	.9450	.2280	.9367	.2434	.9280	.2585
36	.9524	.2129	.9447	.2285	.9365	.2439	.9277	.2590
38	.9522	.2134	.9444	.2291	.9362	.2444	.9274	.2595
40	.9519	.2139	.9442	.2296	.9359	.2449	.9271	.2600
42	.9517	.2145	.9439	.2301	.9356	.2455	.9268	.2605
44	.9514	.2150	.9436	.2306	.9353	.2460	.9265	.2610
46	.9512	.2155	.9434	.2311	.9350	.2465	.9262	.2615
48	.9509	.2160	.9431	.2316	.9347	.2470	.9259	.2620
50	.9507	.2166	.9428	.2322	.9345	.2475	.9256	.2625
52	.9504	.2171	.9426	.2327	.9342	.2480	.9253	.2630
54	.9502	.2176	.9423	.2332	.9339	.2485	.9249	.2635
56	.9499	.2181	.9420	.2337	.9336	.2490	.9246	.2640
58	.9497	.2187	.9417	.2342	.9333	.2495	.9243	.2645
60	.9494	.2192	.9415	.2347	.9330	.2500	.9240	.2650
$c+f$								
0.75	0.73	0.16	0.73	0.17	0.73	0.19	0.72	0.20
1.00	0.98	0.22	0.97	0.23	0.97	0.25	0.96	0.27
1.25	1.22	0.27	1.21	0.29	1.21	0.31	1.20	0.34

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions.

TABLE 6.—STADIA COEFFICIENTS, VERTICAL ROD.

$\cos^2 v$ and $\frac{1}{2} \sin 2v$.

	16°		17°		18°		19°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	.9240	.2650	.9145	.2796	.9045	.2939	.8940	.3078
2	.9237	.2655	.9142	.2801	.9042	.2944	.8936	.3083
4	.9234	.2659	.9139	.2806	.9038	.2948	.8933	.3087
6	.9231	.2664	.9135	.2810	.9035	.2953	.8929	.3092
8	.9228	.2669	.9132	.2815	.9031	.2958	.8926	.3097
10	.9225	.2674	.9129	.2820	.9028	.2962	.8922	.3101
12	.9222	.2679	.9126	.2825	.9024	.2967	.8918	.3106
14	.9219	.2684	.9122	.2830	.9021	.2972	.8915	.3110
16	.9215	.2689	.9119	.2834	.9018	.2976	.8911	.3115
18	.9212	.2694	.9116	.2839	.9014	.2981	.8908	.3119
20	.9209	.2699	.9112	.2844	.9011	.2986	.8904	.3124
22	.9206	.2704	.9109	.2849	.9007	.2990	.8900	.3128
24	.9203	.2709	.9106	.2854	.9004	.2995	.8896	.3133
26	.9200	.2713	.9102	.2858	.9000	.3000	.8893	.3138
28	.9197	.2718	.9099	.2863	.8997	.3004	.8889	.3142
30	.9193	.2723	.9096	.2868	.8993	.3009	.8886	.3147
32	.9190	.2728	.9092	.2873	.8990	.3014	.8882	.3151
34	.9187	.2733	.9089	.2877	.8986	.3019	.8878	.3156
36	.9184	.2738	.9086	.2882	.8983	.3023	.8875	.3160
38	.9181	.2743	.9082	.2887	.8979	.3028	.8871	.3165
40	.9177	.2748	.9079	.2892	.8976	.3032	.8867	.3169
42	.9174	.2752	.9076	.2896	.8972	.3037	.8864	.3174
44	.9171	.2757	.9072	.2901	.8969	.3041	.8860	.3178
46	.9168	.2762	.9069	.2906	.8965	.3046	.8856	.3183
48	.9165	.2767	.9066	.2911	.8961	.3051	.8853	.3187
50	.9161	.2772	.9062	.2915	.8958	.3055	.8849	.3192
52	.9158	.2777	.9059	.2920	.8954	.3060	.8845	.3196
54	.9155	.2781	.9055	.2925	.8951	.3065	.8841	.3201
56	.9152	.2786	.9052	.2930	.8947	.3069	.8838	.3205
58	.9148	.2791	.9048	.2934	.8944	.3074	.8834	.3209
60	.9145	.2796	.9045	.2939	.8940	.3078	.8830	.3214
$c+f$								
0.75	0.72	0.21	0.72	0.23	0.71	0.24	0.71	0.25
1.00	0.96	0.28	0.95	0.30	0.95	0.32	0.94	0.33
1.25	1.20	0.36	1.19	0.38	1.19	0.40	1.18	0.42

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions.

TABLE 6.—STADIA COEFFICIENTS, VERTICAL ROD.

$\cos^2 v$ and $\frac{1}{2} \sin 2v$.

	20°		21°		22°		23°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	.8830	.3214	.8716	.3346	.8597	.3473	.8473	.3597
2	.8826	.3218	.8712	.3350	.8593	.3477	.8469	.3601
4	.8823	.3223	.8708	.3354	.8589	.3482	.8465	.3605
6	.8819	.3227	.8704	.3359	.8585	.3486	.8461	.3609
8	.8815	.3232	.8700	.3363	.8580	.3490	.8457	.3613
10	.8811	.3236	.8696	.3367	.8576	.3494	.8452	.3617
12	.8808	.3241	.8692	.3372	.8572	.3498	.8448	.3621
14	.8804	.3245	.8688	.3376	.8568	.3502	.8444	.3625
16	.8800	.3249	.8684	.3380	.8564	.3507	.8440	.3629
18	.8796	.3254	.8680	.3384	.8560	.3511	.8435	.3633
20	.8793	.3258	.8677	.3389	.8556	.3515	.8431	.3637
22	.8789	.3263	.8673	.3393	.8552	.3519	.8427	.3641
24	.8785	.3267	.8669	.3397	.8548	.3523	.8423	.3645
26	.8781	.3272	.8665	.3401	.8544	.3527	.8418	.3649
28	.8777	.3276	.8661	.3406	.8540	.3531	.8414	.3653
30	.8774	.3280	.8657	.3410	.8536	.3536	.8410	.3657
32	.8770	.3285	.8653	.3414	.8531	.3540	.8406	.3661
34	.8766	.3289	.8649	.3418	.8527	.3544	.8401	.3665
36	.8762	.3293	.8645	.3423	.8523	.3548	.8397	.3669
38	.8758	.3298	.8641	.3427	.8519	.3552	.8393	.3673
40	.8754	.3302	.8637	.3431	.8515	.3556	.8389	.3677
42	.8751	.3307	.8633	.3435	.8511	.3560	.8384	.3680
44	.8747	.3311	.8629	.3440	.8507	.3564	.8380	.3684
46	.8743	.3315	.8625	.3444	.8502	.3568	.8376	.3688
48	.8739	.3320	.8621	.3448	.8498	.3572	.8372	.3692
50	.8735	.3324	.8617	.3452	.8494	.3576	.8367	.3696
52	.8731	.3328	.8613	.3457	.8490	.3580	.8363	.3700
54	.8727	.3333	.8609	.3461	.8486	.3585	.8359	.3704
56	.8724	.3337	.8605	.3465	.8482	.3589	.8354	.3708
58	.8720	.3341	.8601	.3469	.8477	.3593	.8350	.3712
60	.8716	.3346	.8597	.3473	.8473	.3597	.8346	.3716
$c+f$								
0.75	0.70	0.26	0.70	0.27	0.69	0.29	0.69	0.30
1.00	0.94	0.35	0.93	0.37	0.92	0.38	0.92	0.40
1.25	1.17	0.44	1.16	0.46	1.15	0.48	1.15	0.50

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions.

TABLE 6.—STADIA COEFFICIENTS, VERTICAL ROD.

$\text{Cos}^2 v$ and $\frac{1}{2} \sin 2v$.

	24°		25°		26°		27°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
′								
0	.8346	.3716	.8214	.3830	.8078	.3940	.7939	.4045
2	.8341	.3720	.8209	.3834	.8074	.3944	.7934	.4049
4	.8337	.3723	.8205	.3838	.8069	.3947	.7930	.4052
6	.8333	.3727	.8201	.3841	.8065	.3951	.7925	.4055
8	.8328	.3731	.8196	.3845	.8060	.3954	.7920	.4059
10	.8324	.3735	.8192	.3849	.8055	.3958	.7915	.4062
12	.8320	.3739	.8187	.3853	.8051	.3961	.7911	.4066
14	.8315	.3743	.8183	.3856	.8046	.3965	.7906	.4069
16	.8311	.3747	.8178	.3860	.8041	.3969	.7901	.4072
18	.8307	.3751	.8174	.3864	.8037	.3972	.7896	.4076
20	.8302	.3754	.8169	.3867	.8032	.3976	.7892	.4079
22	.8298	.3758	.8165	.3871	.8028	.3979	.7887	.4082
24	.8293	.3762	.8160	.3875	.8023	.3983	.7882	.4086
26	.8289	.3766	.8156	.3878	.8018	.3986	.7877	.4089
28	.8285	.3770	.8151	.3882	.8014	.3990	.7873	.4092
30	.8280	.3774	.8147	.3886	.8009	.3993	.7868	.4096
32	.8276	.3777	.8142	.3889	.8004	.3997	.7863	.4099
34	.8272	.3781	.8138	.3893	.8000	.4000	.7858	.4102
36	.8267	.3785	.8133	.3897	.7995	.4004	.7854	.4106
38	.8263	.3789	.8128	.3900	.7990	.4007	.7849	.4109
40	.8258	.3793	.8124	.3904	.7986	.4011	.7844	.4112
42	.8254	.3796	.8119	.3908	.7981	.4014	.7839	.4116
44	.8249	.3800	.8115	.3911	.7976	.4018	.7834	.4119
46	.8245	.3804	.8110	.3915	.7972	.4021	.7830	.4122
48	.8241	.3808	.8106	.3918	.7967	.4024	.7825	.4126
50	.8236	.3811	.8101	.3922	.7962	.4028	.7820	.4129
52	.8232	.3815	.8097	.3926	.7958	.4031	.7815	.4132
54	.8227	.3819	.8092	.3929	.7953	.4035	.7810	.4135
56	.8223	.3823	.8087	.3933	.7948	.4038	.7806	.4139
58	.8218	.3826	.8083	.3936	.7944	.4042	.7801	.4142
60	.8214	.3830	.8078	.3940	.7939	.4045	.7796	.4145
$c+f$								
0.75	0.68	0.31	0.68	0.32	0.67	0.33	0.66	0.35
1.00	0.91	0.41	0.90	0.43	0.89	0.45	0.89	0.46
1.25	1.14	0.52	1.13	0.54	1.12	0.56	1.11	0.58

$(c+f) \cos v$ and $(c+f) \sin v$.

Natural functions.

TABLE 7.—NATURAL SINES AND COSINES.

′	0°		1°		2°		3°		4°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.00000	One.	.01745	.99985	.03490	.99939	.05234	.99863	.06976	.99756	60
1	.00029	One.	.01774	.99984	.03519	.99938	.05263	.99861	.07005	.99754	59
2	.00058	One.	.01803	.99984	.03548	.99937	.05292	.99860	.07034	.99752	58
3	.00087	One.	.01832	.99983	.03577	.99936	.05321	.99858	.07063	.99750	57
4	.00116	One.	.01862	.99983	.03606	.99935	.05350	.99857	.07092	.99748	56
5	.00145	One.	.01891	.99982	.03635	.99934	.05379	.99855	.07121	.99746	55
6	.00175	One.	.01920	.99982	.03664	.99933	.05408	.99854	.07150	.99744	54
7	.00204	One.	.01949	.99981	.03693	.99932	.05437	.99852	.07179	.99742	53
8	.00233	One.	.01978	.99980	.03723	.99931	.05466	.99851	.07208	.99740	52
9	.00262	One.	.02007	.99980	.03752	.99930	.05495	.99849	.07237	.99738	51
10	.00291	One.	.02036	.99979	.03781	.99929	.05524	.99847	.07266	.99736	50
11	.00320	.99999	.02065	.99979	.03810	.99927	.05553	.99846	.07295	.99734	49
12	.00349	.99999	.02094	.99978	.03839	.99926	.05582	.99844	.07324	.99731	48
13	.00378	.99999	.02123	.99977	.03868	.99925	.05611	.99842	.07353	.99729	47
14	.00407	.99999	.02152	.99977	.03897	.99924	.05640	.99841	.07382	.99727	46
15	.00436	.99999	.02181	.99976	.03926	.99923	.05669	.99839	.07411	.99725	45
16	.00465	.99999	.02211	.99976	.03955	.99922	.05698	.99838	.07440	.99723	44
17	.00495	.99999	.02240	.99975	.03984	.99921	.05727	.99836	.07469	.99721	43
18	.00524	.99999	.02269	.99974	.04013	.99919	.05756	.99834	.07498	.99719	42
19	.00553	.99998	.02298	.99974	.04042	.99918	.05785	.99833	.07527	.99716	41
20	.00582	.99998	.02327	.99973	.04071	.99917	.05814	.99831	.07556	.99714	40
21	.00611	.99998	.02356	.99972	.04100	.99916	.05844	.99829	.07585	.99712	39
22	.00640	.99998	.02385	.99972	.04129	.99915	.05873	.99827	.07614	.99710	38
23	.00669	.99998	.02414	.99971	.04159	.99913	.05902	.99826	.07643	.99708	37
24	.00698	.99998	.02443	.99970	.04188	.99912	.05931	.99824	.07672	.99705	36
25	.00727	.99997	.02472	.99969	.04217	.99911	.05960	.99822	.07701	.99703	35
26	.00756	.99997	.02501	.99969	.04246	.99910	.05989	.99821	.07730	.99701	34
27	.00785	.99997	.02530	.99968	.04275	.99909	.06018	.99819	.07759	.99699	33
28	.00814	.99997	.02560	.99967	.04304	.99907	.06047	.99817	.07788	.99696	32
29	.00844	.99996	.02589	.99966	.04333	.99906	.06076	.99815	.07817	.99694	31
30	.00873	.99996	.02618	.99966	.04362	.99905	.06105	.99813	.07846	.99692	30
31	.00902	.99996	.02647	.99965	.04391	.99904	.06134	.99812	.07875	.99689	29
32	.00931	.99996	.02676	.99964	.04420	.99902	.06163	.99810	.07904	.99687	28
33	.00960	.99995	.02705	.99963	.04449	.99901	.06192	.99808	.07933	.99685	27
34	.00989	.99995	.02734	.99963	.04478	.99900	.06221	.99806	.07962	.99683	26
35	.01018	.99995	.02763	.99962	.04507	.99898	.06250	.99804	.07991	.99680	25
36	.01047	.99995	.02792	.99961	.04536	.99897	.06279	.99803	.08020	.99678	24
37	.01076	.99994	.02821	.99960	.04565	.99896	.06308	.99801	.08049	.99676	23
38	.01105	.99994	.02850	.99959	.04594	.99894	.06337	.99799	.08078	.99673	22
39	.01134	.99994	.02879	.99959	.04623	.99893	.06366	.99797	.08107	.99671	21
40	.01164	.99993	.02908	.99958	.04653	.99892	.06395	.99795	.08136	.99668	20
41	.01193	.99993	.02938	.99957	.04682	.99890	.06424	.99793	.08165	.99666	19
42	.01222	.99993	.02967	.99956	.04711	.99889	.06453	.99792	.08194	.99664	18
43	.01251	.99992	.02996	.99955	.04740	.99888	.06482	.99790	.08223	.99661	17
44	.01280	.99992	.03025	.99954	.04769	.99886	.06511	.99788	.08252	.99659	16
45	.01309	.99991	.03054	.99953	.04798	.99885	.06540	.99786	.08281	.99657	15
46	.01338	.99991	.03083	.99952	.04827	.99883	.06569	.99784	.08310	.99654	14
47	.01367	.99991	.03112	.99952	.04856	.99882	.06598	.99782	.08339	.99652	13
48	.01396	.99990	.03141	.99951	.04885	.99881	.06627	.99780	.08368	.99649	12
49	.01425	.99990	.03170	.99950	.04914	.99879	.06656	.99778	.08397	.99647	11
50	.01454	.99989	.03199	.99949	.04943	.99878	.06685	.99776	.08426	.99644	10
51	.01483	.99989	.03228	.99948	.04972	.99876	.06714	.99774	.08455	.99642	9
52	.01513	.99989	.03257	.99947	.05001	.99875	.06743	.99772	.08484	.99639	8
53	.01542	.99988	.03286	.99946	.05030	.99873	.06773	.99770	.08513	.99637	7
54	.01571	.99988	.03316	.99945	.05059	.99872	.06802	.99768	.08542	.99635	6
55	.01600	.99987	.03345	.99944	.05088	.99870	.06831	.99766	.08571	.99632	5
56	.01629	.99987	.03374	.99943	.05117	.99869	.06860	.99764	.08600	.99630	4
57	.01658	.99986	.03403	.99942	.05146	.99867	.06889	.99762	.08629	.99627	3
58	.01687	.99986	.03432	.99941	.05175	.99866	.06918	.99760	.08658	.99625	2
59	.01716	.99985	.03461	.99940	.05205	.99864	.06947	.99758	.08687	.99622	1
60	.01745	.99985	.03490	.99939	.05234	.99863	.06976	.99756	.08716	.99619	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	89°		88°		87°		86°		85°		

TABLE 7.—NATURAL SINES AND COSINES.

′	5°		6°		7°		8°		9°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.08716	.99619	.10453	.99452	.12187	.99255	.13917	.99027	.15643	.98769	60
1	.08745	.99617	.10482	.99449	.12216	.99251	.13946	.99023	.15672	.98764	59
2	.08774	.99614	.10511	.99446	.12245	.99248	.13975	.99019	.15701	.98760	58
3	.08803	.99612	.10540	.99443	.12274	.99244	.14004	.99015	.15730	.98755	57
4	.08831	.99609	.10569	.99440	.12302	.99240	.14033	.99011	.15758	.98751	56
5	.08860	.99607	.10597	.99437	.12331	.99237	.14061	.99006	.15787	.98746	55
6	.08889	.99604	.10626	.99434	.12360	.99233	.14090	.99002	.15816	.98741	54
7	.08918	.99602	.10655	.99431	.12389	.99230	.14119	.98998	.15845	.98737	53
8	.08947	.99599	.10684	.99428	.12418	.99226	.14148	.98994	.15873	.98732	52
9	.08976	.99596	.10713	.99424	.12447	.99222	.14177	.98990	.15902	.98728	51
10	.09005	.99594	.10742	.99421	.12476	.99219	.14205	.98986	.15931	.98723	50
11	.09034	.99591	.10771	.99418	.12504	.99215	.14234	.98982	.15959	.98718	49
12	.09063	.99588	.10800	.99415	.12533	.99211	.14263	.98978	.15988	.98714	48
13	.09092	.99586	.10829	.99412	.12562	.99208	.14292	.98973	.16017	.98709	47
14	.09121	.99583	.10858	.99409	.12591	.99204	.14320	.98969	.16046	.98704	46
15	.09150	.99580	.10887	.99406	.12620	.99200	.14349	.98965	.16074	.98700	45
16	.09179	.99578	.10916	.99402	.12649	.99197	.14378	.98961	.16103	.98695	44
17	.09208	.99575	.10945	.99399	.12678	.99193	.14407	.98957	.16132	.98690	43
18	.09237	.99572	.10973	.99396	.12706	.99189	.14436	.98953	.16160	.98686	42
19	.09266	.99570	.11002	.99393	.12735	.99186	.14464	.98948	.16189	.98681	41
20	.09295	.99567	.11031	.99390	.12764	.99182	.14493	.98944	.16218	.98676	40
21	.09324	.99564	.11060	.99386	.12793	.99178	.14522	.98940	.16246	.98671	39
22	.09353	.99562	.11089	.99383	.12822	.99175	.14551	.98936	.16275	.98667	38
23	.09382	.99559	.11118	.99380	.12851	.99171	.14580	.98931	.16304	.98662	37
24	.09411	.99556	.11147	.99377	.12880	.99167	.14608	.98927	.16333	.98657	36
25	.09440	.99553	.11176	.99374	.12908	.99163	.14637	.98923	.16361	.98652	35
26	.09469	.99551	.11205	.99370	.12937	.99160	.14666	.98919	.16390	.98648	34
27	.09498	.99548	.11234	.99367	.12966	.99156	.14695	.98914	.16419	.98643	33
28	.09527	.99545	.11263	.99364	.12995	.99152	.14723	.98910	.16447	.98638	32
29	.09556	.99542	.11291	.99360	.13024	.99148	.14752	.98906	.16476	.98633	31
30	.09585	.99540	.11320	.99357	.13053	.99144	.14781	.98902	.16505	.98629	30
31	.09614	.99537	.11349	.99354	.13081	.99141	.14810	.98897	.16533	.98624	29
32	.09642	.99534	.11378	.99351	.13110	.99137	.14838	.98893	.16562	.98619	28
33	.09671	.99531	.11407	.99347	.13139	.99133	.14867	.98889	.16591	.98614	27
34	.09700	.99528	.11436	.99344	.13168	.99129	.14896	.98884	.16620	.98609	26
35	.09729	.99526	.11465	.99341	.13197	.99125	.14925	.98880	.16648	.98604	25
36	.09758	.99523	.11494	.99337	.13226	.99122	.14954	.98876	.16677	.98600	24
37	.09787	.99520	.11523	.99334	.13254	.99118	.14982	.98871	.16706	.98595	23
38	.09816	.99517	.11552	.99331	.13283	.99114	.15011	.98867	.16734	.98590	22
39	.09845	.99514	.11580	.99327	.13312	.99110	.15040	.98863	.16763	.98585	21
40	.09874	.99511	.11609	.99324	.13341	.99106	.15069	.98858	.16792	.98580	20
41	.09903	.99508	.11638	.99320	.13370	.99102	.15097	.98854	.16820	.98575	19
42	.09932	.99506	.11667	.99317	.13399	.99098	.15126	.98849	.16849	.98570	18
43	.09961	.99503	.11696	.99314	.13427	.99094	.15155	.98845	.16878	.98565	17
44	.09990	.99500	.11725	.99310	.13456	.99091	.15184	.98841	.16906	.98561	16
45	.10019	.99497	.11754	.99307	.13485	.99087	.15212	.98836	.16935	.98556	15
46	.10048	.99494	.11783	.99303	.13514	.99083	.15241	.98832	.16964	.98551	14
47	.10077	.99491	.11812	.99300	.13543	.99079	.15270	.98827	.16992	.98546	13
48	.10106	.99488	.11840	.99297	.13572	.99075	.15299	.98823	.17021	.98541	12
49	.10135	.99485	.11869	.99293	.13600	.99071	.15327	.98818	.17050	.98536	11
50	.10164	.99482	.11898	.99290	.13629	.99067	.15356	.98814	.17078	.98531	10
51	.10192	.99479	.11927	.99286	.13658	.99063	.15385	.98809	.17107	.98526	9
52	.10221	.99476	.11956	.99283	.13687	.99059	.15414	.98805	.17136	.98521	8
53	.10250	.99473	.11985	.99279	.13716	.99055	.15442	.98800	.17164	.98516	7
54	.10279	.99470	.12014	.99276	.13744	.99051	.15471	.98796	.17193	.98511	6
55	.10308	.99467	.12043	.99272	.13773	.99047	.15500	.98791	.17222	.98506	5
56	.10337	.99464	.12071	.99269	.13802	.99043	.15529	.98787	.17250	.98501	4
57	.10366	.99461	.12100	.99265	.13831	.99039	.15557	.98782	.17279	.98496	3
58	.10395	.99458	.12129	.99262	.13860	.99035	.15586	.98778	.17308	.98491	2
59	.10424	.99455	.12158	.99258	.13889	.99031	.15615	.98773	.17336	.98486	1
60	.10453	.99452	.12187	.99255	.13917	.99027	.15643	.98769	.17365	.98481	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	84°		83°		82°		81°		80°		

TABLE 7.—NATURAL SINES AND COSINES.

′	10°		11°		12°		13°		14°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.17365	.98481	.19081	.98163	.20791	.97815	.22495	.97437	.24192	.97030	60
1	.17393	.98476	.19109	.98157	.20820	.97809	.22523	.97430	.24220	.97023	59
2	.17422	.98471	.19138	.98152	.20848	.97803	.22552	.97424	.24249	.97015	58
3	.17451	.98466	.19167	.98146	.20877	.97797	.22580	.97417	.24277	.97008	57
4	.17479	.98461	.19195	.98140	.20905	.97791	.22608	.97411	.24305	.97001	56
5	.17508	.98455	.19224	.98135	.20933	.97784	.22637	.97404	.24333	.96994	55
6	.17537	.98450	.19252	.98129	.20962	.97778	.22665	.97398	.24362	.96987	54
7	.17565	.98445	.19281	.98124	.20990	.97772	.22693	.97391	.24390	.96980	53
8	.17594	.98440	.19309	.98118	.21019	.97766	.22722	.97384	.24418	.96973	52
9	.17623	.98435	.19338	.98112	.21047	.97760	.22750	.97378	.24446	.96966	51
10	.17651	.98430	.19366	.98107	.21076	.97754	.22778	.97371	.24474	.96959	50
11	.17680	.98425	.19395	.98101	.21104	.97748	.22807	.97365	.24503	.96952	49
12	.17708	.98420	.19423	.98096	.21132	.97742	.22835	.97358	.24531	.96945	48
13	.17737	.98414	.19452	.98090	.21161	.97735	.22863	.97351	.24559	.96937	47
14	.17766	.98409	.19481	.98084	.21189	.97729	.22892	.97345	.24587	.96930	46
15	.17794	.98404	.19509	.98079	.21218	.97723	.22920	.97338	.24615	.96923	45
16	.17823	.98399	.19538	.98073	.21246	.97717	.22948	.97331	.24644	.96916	44
17	.17852	.98394	.19566	.98067	.21275	.97711	.22977	.97325	.24672	.96909	43
18	.17880	.98389	.19595	.98061	.21303	.97705	.23005	.97318	.24700	.96902	42
19	.17909	.98383	.19623	.98056	.21331	.97698	.23033	.97311	.24728	.96894	41
20	.17937	.98378	.19652	.98050	.21360	.97692	.23062	.97304	.24756	.96887	40
21	.17966	.98373	.19680	.98044	.21388	.97686	.23090	.97298	.24784	.96880	39
22	.17995	.98368	.19709	.98039	.21417	.97680	.23118	.97291	.24813	.96873	38
23	.18023	.98362	.19737	.98033	.21445	.97673	.23146	.97284	.24841	.96866	37
24	.18052	.98357	.19766	.98027	.21474	.97667	.23175	.97278	.24869	.96858	36
25	.18081	.98352	.19794	.98021	.21502	.97661	.23203	.97271	.24897	.96851	35
26	.18109	.98347	.19823	.98016	.21530	.97655	.23231	.97264	.24925	.96844	34
27	.18138	.98341	.19851	.98010	.21559	.97648	.23260	.97257	.24954	.96837	33
28	.18166	.98336	.19880	.98004	.21587	.97642	.23288	.97251	.24982	.96829	32
29	.18195	.98331	.19908	.97998	.21616	.97636	.23316	.97244	.25010	.96822	31
30	.18224	.98325	.19937	.97992	.21644	.97630	.23345	.97237	.25038	.96815	30
31	.18252	.98320	.19965	.97987	.21672	.97623	.23373	.97230	.25066	.96807	29
32	.18281	.98315	.19994	.97981	.21701	.97617	.23401	.97223	.25094	.96800	28
33	.18309	.98310	.20022	.97975	.21729	.97611	.23429	.97217	.25122	.96793	27
34	.18338	.98304	.20051	.97969	.21758	.97604	.23458	.97210	.25151	.96786	26
35	.18367	.98299	.20079	.97963	.21786	.97598	.23486	.97203	.25179	.96778	25
36	.18395	.98294	.20108	.97958	.21814	.97592	.23514	.97196	.25207	.96771	24
37	.18424	.98288	.20136	.97952	.21843	.97585	.23542	.97189	.25235	.96764	23
38	.18452	.98283	.20165	.97946	.21871	.97579	.23571	.97182	.25263	.96756	22
39	.18481	.98277	.20193	.97940	.21899	.97573	.23599	.97176	.25291	.96749	21
40	.18509	.98272	.20222	.97934	.21928	.97566	.23627	.97169	.25320	.96742	20
41	.18538	.98267	.20250	.97928	.21956	.97560	.23656	.97162	.25348	.96734	19
42	.18567	.98261	.20279	.97922	.21985	.97553	.23684	.97155	.25376	.96727	18
43	.18595	.98256	.20307	.97916	.22013	.97547	.23712	.97148	.25404	.96719	17
44	.18624	.98250	.20336	.97910	.22041	.97541	.23740	.97141	.25432	.96712	16
45	.18652	.98245	.20364	.97905	.22070	.97534	.23769	.97134	.25460	.96705	15
46	.18681	.98240	.20393	.97899	.22098	.97528	.23797	.97127	.25488	.96697	14
47	.18710	.98234	.20421	.97893	.22126	.97521	.23825	.97120	.25516	.96690	13
48	.18738	.98229	.20450	.97887	.22155	.97515	.23853	.97113	.25545	.96682	12
49	.18767	.98223	.20478	.97881	.22183	.97508	.23882	.97106	.25573	.96675	11
50	.18795	.98218	.20507	.97875	.22212	.97502	.23910	.97100	.25601	.96667	10
51	.18824	.98212	.20535	.97869	.22240	.97496	.23938	.97093	.25629	.96660	9
52	.18852	.98207	.20563	.97863	.22268	.97489	.23966	.97086	.25657	.96653	8
53	.18881	.98201	.20592	.97857	.22297	.97483	.23995	.97079	.25685	.96645	7
54	.18910	.98196	.20620	.97851	.22325	.97476	.24023	.97072	.25713	.96638	6
55	.18938	.98190	.20649	.97845	.22353	.97470	.24051	.97065	.25741	.96630	5
56	.18967	.98185	.20677	.97839	.22382	.97463	.24079	.97058	.25769	.96623	4
57	.18995	.98179	.20706	.97833	.22410	.97457	.24108	.97051	.25798	.96615	3
58	.19024	.98174	.20734	.97827	.22438	.97450	.24136	.97044	.25826	.96608	2
59	.19052	.98168	.20763	.97821	.22467	.97444	.24164	.97037	.25854	.96600	1
60	.19081	.98163	.20791	.97815	.22495	.97437	.24192	.97030	.25882	.96593	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	79°		78°		77°		76°		75°		

TABLE 7.—NATURAL SINES AND COSINES.

′	15°		16°		17°		18°		19°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.25882	.96593	.27564	.96126	.29237	.95630	.30902	.95106	.32557	.94552	60
1	.25910	.96585	.27592	.96118	.29265	.95622	.30929	.95097	.32584	.94542	59
2	.25938	.96578	.27620	.96110	.29293	.95613	.30957	.95088	.32612	.94533	58
3	.25966	.96570	.27648	.96102	.29321	.95605	.30985	.95079	.32639	.94523	57
4	.25994	.96562	.27676	.96094	.29348	.95596	.31012	.95070	.32667	.94514	56
5	.26022	.96555	.27704	.96086	.29376	.95588	.31040	.95061	.32694	.94504	55
6	.26050	.96547	.27731	.96078	.29404	.95579	.31068	.95052	.32722	.94495	54
7	.26079	.96540	.27759	.96070	.29432	.95571	.31095	.95043	.32749	.94485	53
8	.26107	.96532	.27787	.96062	.29460	.95562	.31123	.95033	.32777	.94476	52
9	.26135	.96524	.27815	.96054	.29487	.95554	.31151	.95024	.32804	.94466	51
10	.26163	.96517	.27843	.96046	.29515	.95545	.31178	.95015	.32832	.94457	50
11	.26191	.96509	.27871	.96037	.29543	.95536	.31206	.95006	.32859	.94447	49
12	.26219	.96502	.27899	.96029	.29571	.95528	.31233	.94997	.32887	.94438	48
13	.26247	.96494	.27927	.96021	.29599	.95519	.31261	.94988	.32914	.94428	47
14	.26275	.96486	.27955	.96013	.29626	.95511	.31289	.94979	.32942	.94418	46
15	.26303	.96479	.27983	.96005	.29654	.95502	.31316	.94970	.32969	.94409	45
16	.26331	.96471	.28011	.95997	.29682	.95493	.31344	.94961	.32997	.94399	44
17	.26359	.96463	.28039	.95989	.29710	.95485	.31372	.94952	.33024	.94390	43
18	.26387	.96456	.28067	.95981	.29737	.95476	.31399	.94943	.33051	.94380	42
19	.26415	.96448	.28095	.95972	.29765	.95467	.31427	.94933	.33079	.94370	41
20	.26443	.96440	.28123	.95964	.29793	.95459	.31454	.94924	.33106	.94361	40
21	.26471	.96433	.28150	.95956	.29821	.95450	.31482	.94915	.33134	.94351	39
22	.26500	.96425	.28178	.95948	.29849	.95441	.31510	.94906	.33161	.94342	38
23	.26528	.96417	.28206	.95940	.29876	.95433	.31537	.94897	.33189	.94332	37
24	.26556	.96410	.28234	.95931	.29904	.95424	.31565	.94888	.33216	.94322	36
25	.26584	.96402	.28262	.95923	.29932	.95415	.31593	.94878	.33244	.94313	35
26	.26612	.96394	.28290	.95915	.29960	.95407	.31620	.94869	.33271	.94303	34
27	.26640	.96386	.28318	.95907	.29987	.95398	.31648	.94860	.33298	.94293	33
28	.26668	.96379	.28346	.95898	.30015	.95389	.31675	.94851	.33326	.94284	32
29	.26696	.96371	.28374	.95890	.30043	.95380	.31703	.94842	.33353	.94274	31
30	.26724	.96363	.28402	.95882	.30071	.95372	.31730	.94832	.33381	.94264	30
31	.26752	.96355	.28429	.95874	.30098	.95363	.31758	.94823	.33408	.94254	29
32	.26780	.96347	.28457	.95865	.30126	.95354	.31786	.94814	.33436	.94245	28
33	.26808	.96340	.28485	.95857	.30154	.95345	.31813	.94805	.33463	.94235	27
34	.26836	.96332	.28513	.95849	.30182	.95337	.31841	.94795	.33490	.94225	26
35	.26864	.96324	.28541	.95841	.30209	.95328	.31868	.94786	.33518	.94215	25
36	.26892	.96316	.28569	.95832	.30237	.95319	.31896	.94777	.33545	.94206	24
37	.26920	.96308	.28597	.95824	.30265	.95310	.31923	.94768	.33573	.94196	23
38	.26948	.96301	.28625	.95816	.30292	.95301	.31951	.94758	.33600	.94186	22
39	.26976	.96293	.28652	.95807	.30320	.95293	.31979	.94749	.33627	.94176	21
40	.27004	.96285	.28680	.95799	.30348	.95284	.32006	.94740	.33655	.94167	20
41	.27032	.96277	.28708	.95791	.30376	.95275	.32034	.94730	.33682	.94157	19
42	.27060	.96269	.28736	.95782	.30403	.95266	.32061	.94721	.33710	.94147	18
43	.27088	.96261	.28764	.95774	.30431	.95257	.32089	.94712	.33737	.94137	17
44	.27116	.96253	.28792	.95766	.30459	.95248	.32116	.94702	.33764	.94127	16
45	.27144	.96246	.28820	.95757	.30486	.95240	.32144	.94693	.33792	.94118	15
46	.27172	.96238	.28847	.95749	.30514	.95231	.32171	.94684	.33819	.94108	14
47	.27200	.96230	.28875	.95740	.30542	.95222	.32199	.94674	.33846	.94098	13
48	.27228	.96222	.28903	.95732	.30570	.95213	.32227	.94665	.33874	.94088	12
49	.27256	.96214	.28931	.95724	.30597	.95204	.32254	.94656	.33901	.94078	11
50	.27284	.96206	.28959	.95715	.30625	.95195	.32282	.94646	.33929	.94068	10
51	.27312	.96198	.28987	.95707	.30653	.95186	.32309	.94637	.33956	.94058	9
52	.27340	.96190	.29015	.95698	.30680	.95177	.32337	.94627	.33983	.94049	8
53	.27368	.96182	.29042	.95690	.30708	.95168	.32364	.94618	.34011	.94039	7
54	.27396	.96174	.29070	.95681	.30736	.95159	.32392	.94609	.34038	.94029	6
55	.27424	.96166	.29098	.95673	.30763	.95150	.32419	.94599	.34065	.94019	5
56	.27452	.96158	.29126	.95664	.30791	.95142	.32447	.94590	.34093	.94009	4
57	.27480	.96150	.29154	.95656	.30819	.95133	.32474	.94580	.34120	.93999	3
58	.27508	.96142	.29182	.95647	.30846	.95124	.32502	.94571	.34147	.93989	2
59	.27536	.96134	.29209	.95639	.30874	.95115	.32529	.94561	.34175	.93979	1
60	.27564	.96126	.29237	.95630	.30902	.95106	.32557	.94552	.34202	.93969	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	74°		73°		72°		71°		70°		

TABLE 7.—NATURAL SINES AND COSINES.

′	20°		21°		22°		23°		24°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.34202	.93969	.35837	.93358	.37461	.92718	.39073	.92050	.40674	.91355	60
1	.34229	.93959	.35864	.93348	.37488	.92707	.39100	.92039	.40700	.91343	59
2	.34257	.93949	.35891	.93337	.37515	.92697	.39127	.92028	.40727	.91331	58
3	.34284	.93939	.35918	.93327	.37542	.92686	.39153	.92016	.40753	.91319	57
4	.34311	.93929	.35945	.93316	.37569	.92675	.39180	.92005	.40780	.91307	56
5	.34339	.93919	.35973	.93306	.37595	.92664	.39207	.91994	.40806	.91295	55
6	.34366	.93909	.36000	.93295	.37622	.92653	.39234	.91982	.40833	.91283	54
7	.34393	.93899	.36027	.93285	.37649	.92642	.39260	.91971	.40860	.91272	53
8	.34421	.93889	.36054	.93274	.37676	.92631	.39287	.91959	.40886	.91260	52
9	.34448	.93879	.36081	.93264	.37703	.92620	.39314	.91948	.40913	.91248	51
10	.34475	.93869	.36108	.93253	.37730	.92609	.39341	.91936	.40939	.91236	50
11	.34503	.93859	.36135	.93243	.37757	.92598	.39367	.91925	.40966	.91224	49
12	.34530	.93849	.36162	.93232	.37784	.92587	.39394	.91914	.40992	.91212	48
13	.34557	.93839	.36190	.93222	.37811	.92576	.39421	.91902	.41019	.91200	47
14	.34584	.93829	.36217	.93211	.37838	.92565	.39448	.91891	.41045	.91188	46
15	.34612	.93819	.36244	.93201	.37865	.92554	.39474	.91879	.41072	.91176	45
16	.34639	.93809	.36271	.93190	.37892	.92543	.39501	.91868	.41098	.91164	44
17	.34666	.93799	.36298	.93180	.37919	.92532	.39528	.91856	.41125	.91152	43
18	.34694	.93789	.36325	.93169	.37946	.92521	.39555	.91845	.41151	.91140	42
19	.34721	.93779	.36352	.93159	.37973	.92510	.39581	.91833	.41178	.91128	41
20	.34748	.93769	.36379	.93148	.37999	.92499	.39608	.91822	.41204	.91116	40
21	.34775	.93759	.36406	.93137	.38026	.92488	.39635	.91810	.41231	.91104	39
22	.34803	.93748	.36434	.93127	.38053	.92477	.39661	.91799	.41257	.91092	38
23	.34830	.93738	.36461	.93116	.38080	.92466	.39688	.91787	.41284	.91080	37
24	.34857	.93728	.36488	.93106	.38107	.92455	.39715	.91775	.41310	.91068	36
25	.34884	.93718	.36515	.93095	.38134	.92444	.39741	.91764	.41337	.91056	35
26	.34912	.93708	.36542	.93084	.38161	.92432	.39768	.91752	.41363	.91044	34
27	.34939	.93698	.36569	.93074	.38188	.92421	.39795	.91741	.41390	.91032	33
28	.34966	.93688	.36596	.93063	.38215	.92410	.39822	.91729	.41416	.91020	32
29	.34993	.93677	.36623	.93052	.38241	.92399	.39848	.91718	.41443	.91008	31
30	.35021	.93667	.36650	.93042	.38268	.92388	.39875	.91706	.41469	.90996	30
31	.35048	.93657	.36677	.93031	.38295	.92377	.39902	.91694	.41496	.90984	29
32	.35075	.93647	.36704	.93020	.38322	.92366	.39928	.91683	.41522	.90972	28
33	.35102	.93637	.36731	.93010	.38349	.92355	.39955	.91671	.41549	.90960	27
34	.35130	.93626	.36758	.92999	.38376	.92343	.39982	.91660	.41575	.90948	26
35	.35157	.93616	.36785	.92988	.38403	.92332	.40008	.91648	.41602	.90936	25
36	.35184	.93606	.36812	.92978	.38430	.92321	.40035	.91636	.41628	.90924	24
37	.35211	.93596	.36839	.92967	.38456	.92310	.40062	.91625	.41655	.90911	23
38	.35239	.93585	.36867	.92956	.38483	.92299	.40088	.91613	.41681	.90899	22
39	.35266	.93575	.36894	.92945	.38510	.92287	.40115	.91601	.41707	.90887	21
40	.35293	.93565	.36921	.92935	.38537	.92276	.40141	.91590	.41734	.90875	20
41	.35320	.93555	.36948	.92924	.38564	.92265	.40168	.91578	.41760	.90863	19
42	.35347	.93544	.36975	.92913	.38591	.92254	.40195	.91566	.41787	.90851	18
43	.35375	.93534	.37002	.92902	.38617	.92243	.40221	.91555	.41813	.90839	17
44	.35402	.93524	.37029	.92892	.38644	.92231	.40248	.91543	.41840	.90826	16
45	.35429	.93514	.37056	.92881	.38671	.92220	.40275	.91531	.41866	.90814	15
46	.35456	.93503	.37083	.92870	.38698	.92209	.40301	.91519	.41892	.90802	14
47	.35484	.93493	.37110	.92859	.38725	.92198	.40328	.91508	.41919	.90790	13
48	.35511	.93483	.37137	.92849	.38752	.92186	.40355	.91496	.41945	.90778	12
49	.35538	.93472	.37164	.92838	.38778	.92175	.40381	.91484	.41972	.90766	11
50	.35565	.93462	.37191	.92827	.38805	.92164	.40408	.91472	.41998	.90753	10
51	.35592	.93452	.37218	.92816	.38832	.92152	.40434	.91461	.42024	.90741	9
52	.35619	.93441	.37245	.92805	.38859	.92141	.40461	.91449	.42051	.90729	8
53	.35647	.93431	.37272	.92794	.38886	.92130	.40488	.91437	.42077	.90717	7
54	.35674	.93420	.37299	.92784	.38912	.92119	.40514	.91425	.42104	.90704	6
55	.35701	.93410	.37326	.92773	.38939	.92107	.40541	.91414	.42130	.90692	5
56	.35728	.93400	.37353	.92762	.38966	.92096	.40567	.91402	.42156	.90680	4
57	.35755	.93389	.37380	.92751	.38993	.92085	.40594	.91390	.42183	.90668	3
58	.35782	.93379	.37407	.92740	.39020	.92073	.40621	.91378	.42209	.90655	2
59	.35810	.93368	.37434	.92729	.39046	.92062	.40647	.91366	.42235	.90643	1
60	.35837	.93358	.37461	.92718	.39073	.92050	.40674	.91355	.42262	.90631	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	69°		68°		67°		66°		65°		

TABLE 7.—NATURAL SINES AND COSINES.

′	25°		26°		27°		28°		29°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.42262	.90631	.43837	.89879	.45399	.89101	.46947	.88295	.48481	.87462	60
1	.42288	.90618	.43863	.89867	.45425	.89087	.46973	.88281	.48506	.87448	59
2	.42315	.90606	.43889	.89854	.45451	.89074	.46999	.88267	.48532	.87434	58
3	.42341	.90594	.43916	.89841	.45477	.89061	.47024	.88254	.48557	.87420	57
4	.42367	.90582	.43942	.89828	.45503	.89048	.47050	.88240	.48583	.87406	56
5	.42394	.90569	.43968	.89816	.45529	.89035	.47076	.88226	.48608	.87391	55
6	.42420	.90557	.43994	.89803	.45554	.89021	.47101	.88213	.48634	.87377	54
7	.42446	.90545	.44020	.89790	.45580	.89008	.47127	.88199	.48659	.87363	53
8	.42473	.90532	.44046	.89777	.45606	.88995	.47153	.88185	.48684	.87349	52
9	.42499	.90520	.44072	.89764	.45632	.88981	.47178	.88172	.48710	.87335	51
10	.42525	.90507	.44098	.89752	.45658	.88968	.47204	.88158	.48735	.87321	50
11	.42552	.90495	.44124	.89739	.45684	.88955	.47229	.88144	.48761	.87306	49
12	.42578	.90483	.44151	.89726	.45710	.88942	.47255	.88130	.48786	.87292	48
13	.42604	.90470	.44177	.89713	.45736	.88928	.47281	.88117	.48811	.87278	47
14	.42631	.90458	.44203	.89700	.45762	.88915	.47306	.88103	.48837	.87264	46
15	.42657	.90446	.44229	.89687	.45787	.88902	.47332	.88089	.48862	.87250	45
16	.42683	.90433	.44255	.89674	.45813	.88888	.47358	.88075	.48888	.87235	44
17	.42709	.90421	.44281	.89662	.45839	.88875	.47383	.88062	.48913	.87221	43
18	.42736	.90408	.44307	.89649	.45865	.88862	.47409	.88048	.48938	.87207	42
19	.42762	.90396	.44333	.89636	.45891	.88848	.47434	.88034	.48964	.87193	41
20	.42788	.90383	.44359	.89623	.45917	.88835	.47460	.88020	.48989	.87178	40
21	.42815	.90371	.44385	.89610	.45942	.88822	.47486	.88006	.49014	.87164	39
22	.42841	.90358	.44411	.89597	.45968	.88808	.47511	.87993	.49040	.87150	38
23	.42867	.90346	.44437	.89584	.45994	.88795	.47537	.87979	.49065	.87136	37
24	.42894	.90334	.44464	.89571	.46020	.88782	.47562	.87965	.49090	.87121	36
25	.42920	.90321	.44490	.89558	.46046	.88768	.47588	.87951	.49116	.87107	35
26	.42946	.90309	.44516	.89545	.46072	.88755	.47614	.87937	.49141	.87093	34
27	.42972	.90296	.44542	.89532	.46097	.88741	.47639	.87923	.49166	.87079	33
28	.42999	.90284	.44568	.89519	.46123	.88728	.47665	.87909	.49192	.87064	32
29	.43025	.90271	.44594	.89506	.46149	.88715	.47690	.87896	.49217	.87050	31
30	.43051	.90259	.44620	.89493	.46175	.88701	.47716	.87882	.49242	.87036	30
31	.43077	.90246	.44646	.89480	.46201	.88688	.47741	.87868	.49268	.87021	29
32	.43104	.90233	.44672	.89467	.46226	.88674	.47767	.87854	.49293	.87007	28
33	.43130	.90221	.44698	.89454	.46252	.88661	.47793	.87840	.49318	.86993	27
34	.43156	.90208	.44724	.89441	.46278	.88647	.47818	.87826	.49344	.86978	26
35	.43182	.90196	.44750	.89428	.46304	.88634	.47844	.87812	.49369	.86964	25
36	.43209	.90183	.44776	.89415	.46330	.88620	.47869	.87798	.49394	.86949	24
37	.43235	.90171	.44802	.89402	.46355	.88607	.47895	.87784	.49419	.86935	23
38	.43261	.90158	.44828	.89389	.46381	.88593	.47920	.87770	.49445	.86921	22
39	.43287	.90146	.44854	.89376	.46407	.88580	.47946	.87756	.49470	.86906	21
40	.43313	.90133	.44880	.89363	.46433	.88566	.47971	.87743	.49495	.86892	20
41	.43340	.90120	.44906	.89350	.46458	.88553	.47997	.87729	.49521	.86878	19
42	.43366	.90108	.44932	.89337	.46484	.88539	.48022	.87715	.49546	.86863	18
43	.43392	.90095	.44958	.89324	.46510	.88526	.48048	.87701	.49571	.86849	17
44	.43418	.90082	.44984	.89311	.46536	.88512	.48073	.87687	.49596	.86834	16
45	.43445	.90070	.45010	.89298	.46561	.88499	.48099	.87673	.49622	.86820	15
46	.43471	.90057	.45036	.89285	.46587	.88485	.48124	.87659	.49647	.86805	14
47	.43497	.90045	.45062	.89272	.46613	.88472	.48150	.87645	.49672	.86791	13
48	.43523	.90032	.45088	.89259	.46639	.88458	.48175	.87631	.49697	.86777	12
49	.43549	.90019	.45114	.89245	.46664	.88445	.48201	.87617	.49723	.86762	11
50	.43575	.90007	.45140	.89232	.46690	.88431	.48226	.87603	.49748	.86748	10
51	.43602	.89994	.45166	.89219	.46716	.88417	.48252	.87589	.49773	.86733	9
52	.43628	.89981	.45192	.89206	.46742	.88404	.48277	.87575	.49798	.86719	8
53	.43654	.89968	.45218	.89193	.46767	.88390	.48303	.87561	.49824	.86704	7
54	.43680	.89956	.45243	.89180	.46793	.88377	.48328	.87546	.49849	.86690	6
55	.43706	.89943	.45269	.89167	.46819	.88363	.48354	.87532	.49874	.86675	5
56	.43733	.89930	.45295	.89153	.46844	.88349	.48379	.87518	.49899	.86661	4
57	.43759	.89918	.45321	.89140	.46870	.88336	.48405	.87504	.49924	.86646	3
58	.43785	.89905	.45347	.89127	.46896	.88322	.48430	.87490	.49950	.86632	2
59	.43811	.89892	.45373	.89114	.46921	.88308	.48456	.87476	.49975	.86617	1
60	.43837	.89879	.45399	.89101	.46947	.88295	.48481	.87462	.50000	.86603	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	64°		63°		62°		61°		60°		

TABLE 7.—NATURAL SINES AND COSINES.

′	30°		31°		32°		33°		34°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.50000	.86603	.51504	.85717	.52992	.84805	.54464	.83867	.55919	.82904	60
1	.50025	.86588	.51529	.85702	.53017	.84789	.54488	.83851	.55943	.82887	59
2	.50050	.86573	.51554	.85687	.53041	.84774	.54513	.83835	.55968	.82871	58
3	.50076	.86559	.51579	.85672	.53066	.84759	.54537	.83819	.55992	.82855	57
4	.50101	.86544	.51604	.85657	.53091	.84743	.54561	.83804	.56016	.82839	56
5	.50126	.86530	.51628	.85642	.53115	.84728	.54586	.83788	.56040	.82822	55
6	.50151	.86515	.51653	.85627	.53140	.84712	.54610	.83772	.56064	.82806	54
7	.50176	.86501	.51678	.85612	.53164	.84697	.54635	.83756	.56088	.82790	53
8	.50201	.86486	.51703	.85597	.53189	.84681	.54659	.83740	.56112	.82773	52
9	.50227	.86471	.51728	.85582	.53214	.84666	.54683	.83724	.56136	.82757	51
10	.50252	.86457	.51753	.85567	.53238	.84650	.54708	.83708	.56160	.82741	50
11	.50277	.86442	.51778	.85551	.53263	.84635	.54732	.83692	.56184	.82724	49
12	.50302	.86427	.51803	.85536	.53288	.84619	.54756	.83676	.56208	.82708	48
13	.50327	.86413	.51828	.85521	.53312	.84604	.54781	.83660	.56232	.82692	47
14	.50352	.86398	.51852	.85506	.53337	.84588	.54805	.83645	.56256	.82675	46
15	.50377	.86384	.51877	.85491	.53361	.84573	.54829	.83629	.56280	.82659	45
16	.50403	.86369	.51902	.85476	.53386	.84557	.54854	.83613	.56305	.82643	44
17	.50428	.86354	.51927	.85461	.53411	.84542	.54878	.83597	.56329	.82626	43
18	.50453	.86340	.51952	.85446	.53435	.84526	.54902	.83581	.56353	.82610	42
19	.50478	.86325	.51977	.85431	.53460	.84511	.54927	.83565	.56377	.82593	41
20	.50503	.86310	.52002	.85416	.53484	.84495	.54951	.83549	.56401	.82577	40
21	.50528	.86295	.52026	.85401	.53509	.84480	.54975	.83533	.56425	.82561	39
22	.50553	.86281	.52051	.85385	.53534	.84464	.54999	.83517	.56449	.82544	38
23	.50578	.86266	.52076	.85370	.53558	.84448	.55024	.83501	.56473	.82528	37
24	.50603	.86251	.52101	.85355	.53583	.84433	.55048	.83485	.56497	.82511	36
25	.50628	.86237	.52126	.85340	.53607	.84417	.55072	.83469	.56521	.82495	35
26	.50654	.86222	.52151	.85325	.53632	.84402	.55097	.83453	.56545	.82478	34
27	.50679	.86207	.52175	.85310	.53656	.84386	.55121	.83437	.56569	.82462	33
28	.50704	.86192	.52200	.85294	.53681	.84370	.55145	.83421	.56593	.82446	32
29	.50729	.86178	.52225	.85279	.53705	.84355	.55169	.83405	.56617	.82429	31
30	.50754	.86163	.52250	.85264	.53730	.84339	.55194	.83389	.56641	.82413	30
31	.50779	.86148	.52275	.85249	.53754	.84324	.55218	.83373	.56665	.82396	29
32	.50804	.86133	.52299	.85234	.53779	.84308	.55242	.83356	.56689	.82380	28
33	.50829	.86119	.52324	.85218	.53804	.84292	.55266	.83340	.56713	.82363	27
34	.50854	.86104	.52349	.85203	.53828	.84277	.55291	.83324	.56736	.82347	26
35	.50879	.86089	.52374	.85188	.53853	.84261	.55315	.83308	.56760	.82330	25
36	.50904	.86074	.52399	.85173	.53877	.84245	.55339	.83292	.56784	.82314	24
37	.50929	.86059	.52423	.85157	.53902	.84230	.55363	.83276	.56808	.82297	23
38	.50954	.86045	.52448	.85142	.53926	.84214	.55388	.83260	.56832	.82281	22
39	.50979	.86030	.52473	.85127	.53951	.84198	.55412	.83244	.56856	.82264	21
40	.51004	.86015	.52498	.85112	.53975	.84182	.55436	.83228	.56880	.82248	20
41	.51029	.86000	.52522	.85096	.54000	.84167	.55460	.83212	.56904	.82231	19
42	.51054	.85985	.52547	.85081	.54024	.84151	.55484	.83195	.56928	.82214	18
43	.51079	.85970	.52572	.85066	.54049	.84135	.55509	.83179	.56952	.82198	17
44	.51104	.85956	.52597	.85051	.54073	.84120	.55533	.83163	.56976	.82181	16
45	.51129	.85941	.52621	.85035	.54097	.84104	.55557	.83147	.57000	.82165	15
46	.51154	.85926	.52646	.85020	.54122	.84088	.55581	.83131	.57024	.82148	14
47	.51179	.85911	.52671	.85005	.54146	.84072	.55605	.83115	.57047	.82132	13
48	.51204	.85896	.52696	.84989	.54171	.84057	.55630	.83098	.57071	.82115	12
49	.51229	.85881	.52720	.84974	.54195	.84041	.55654	.83082	.57095	.82098	11
50	.51254	.85866	.52745	.84959	.54220	.84025	.55678	.83066	.57119	.82082	10
51	.51279	.85851	.52770	.84943	.54244	.84009	.55702	.83050	.57143	.82065	9
52	.51304	.85836	.52794	.84928	.54269	.83994	.55726	.83034	.57167	.82048	8
53	.51329	.85821	.52819	.84913	.54293	.83978	.55750	.83017	.57191	.82032	7
54	.51354	.85806	.52844	.84897	.54317	.83962	.55775	.83001	.57215	.82015	6
55	.51379	.85792	.52869	.84882	.54342	.83946	.55799	.82985	.57238	.81999	5
56	.51404	.85777	.52893	.84866	.54366	.83930	.55823	.82969	.57262	.81982	4
57	.51429	.85762	.52918	.84851	.54391	.83915	.55847	.82953	.57286	.81965	3
58	.51454	.85747	.52943	.84836	.54415	.83899	.55871	.82936	.57310	.81949	2
59	.51479	.85732	.52967	.84820	.54440	.83883	.55895	.82920	.57334	.81932	1
60	.51504	.85717	.52992	.84805	.54464	.83867	.55919	.82904	.57358	.81915	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	59°		58°		57°		56°		55°		

TABLE 7.—NATURAL SINES AND COSINES.

′	35°		36°		37°		38°		39°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.57358	.81915	.58779	.80902	.60182	.79864	.61566	.78801	.62932	.77715	60
1	.57381	.81899	.58802	.80885	.60205	.79846	.61589	.78783	.62955	.77696	59
2	.57405	.81882	.58826	.80867	.60228	.79829	.61612	.78765	.62977	.77678	58
3	.57429	.81865	.58849	.80850	.60251	.79811	.61635	.78747	.63000	.77660	57
4	.57453	.81848	.58873	.80833	.60274	.79793	.61658	.78729	.63022	.77641	56
5	.57477	.81832	.58896	.80816	.60298	.79776	.61681	.78711	.63045	.77623	55
6	.57501	.81815	.58920	.80799	.60321	.79758	.61704	.78694	.63068	.77605	54
7	.57524	.81798	.58943	.80782	.60344	.79741	.61726	.78676	.63090	.77586	53
8	.57548	.81782	.58967	.80765	.60367	.79723	.61749	.78658	.63113	.77568	52
9	.57572	.81765	.58990	.80748	.60390	.79706	.61772	.78640	.63135	.77550	51
10	.57596	.81748	.59014	.80730	.60414	.79688	.61795	.78622	.63158	.77531	50
11	.57619	.81731	.59037	.80713	.60437	.79671	.61818	.78604	.63180	.77513	49
12	.57643	.81714	.59061	.80696	.60460	.79653	.61841	.78586	.63203	.77494	48
13	.57667	.81698	.59084	.80679	.60483	.79635	.61864	.78568	.63225	.77476	47
14	.57691	.81681	.59108	.80662	.60506	.79618	.61887	.78550	.63248	.77458	46
15	.57715	.81664	.59131	.80644	.60529	.79600	.61909	.78532	.63271	.77439	45
16	.57738	.81647	.59154	.80627	.60553	.79583	.61932	.78514	.63293	.77421	44
17	.57762	.81631	.59178	.80610	.60576	.79565	.61955	.78496	.63316	.77402	43
18	.57786	.81614	.59201	.80593	.60599	.79547	.61978	.78478	.63338	.77384	42
19	.57810	.81597	.59225	.80576	.60622	.79530	.62001	.78460	.63361	.77366	41
20	.57833	.81580	.59248	.80558	.60645	.79512	.62024	.78442	.63383	.77347	40
21	.57857	.81563	.59272	.80541	.60668	.79494	.62046	.78424	.63406	.77329	39
22	.57881	.81546	.59295	.80524	.60691	.79477	.62069	.78405	.63428	.77310	38
23	.57904	.81530	.59318	.80507	.60714	.79459	.62092	.78387	.63451	.77292	37
24	.57928	.81513	.59342	.80489	.60738	.79441	.62115	.78369	.63473	.77273	36
25	.57952	.81496	.59365	.80472	.60761	.79424	.62138	.78351	.63496	.77255	35
26	.57976	.81479	.59389	.80455	.60784	.79406	.62160	.78333	.63518	.77236	34
27	.57999	.81462	.59412	.80438	.60807	.79388	.62183	.78315	.63540	.77218	33
28	.58023	.81445	.59436	.80420	.60830	.79371	.62206	.78297	.63563	.77199	32
29	.58047	.81428	.59459	.80403	.60853	.79353	.62229	.78279	.63585	.77181	31
30	.58070	.81412	.59482	.80386	.60876	.79335	.62251	.78261	.63608	.77162	30
31	.58094	.81395	.59506	.80368	.60899	.79318	.62274	.78243	.63630	.77144	29
32	.58118	.81378	.59529	.80351	.60922	.79300	.62297	.78225	.63653	.77125	28
33	.58141	.81361	.59552	.80334	.60945	.79282	.62320	.78206	.63675	.77107	27
34	.58165	.81344	.59576	.80316	.60968	.79264	.62342	.78188	.63698	.77088	26
35	.58189	.81327	.59599	.80299	.60991	.79247	.62365	.78170	.63720	.77070	25
36	.58212	.81310	.59622	.80282	.61015	.79229	.62388	.78152	.63742	.77051	24
37	.58236	.81293	.59646	.80264	.61038	.79211	.62411	.78134	.63765	.77033	23
38	.58260	.81276	.59669	.80247	.61061	.79193	.62433	.78116	.63787	.77014	22
39	.58283	.81259	.59693	.80230	.61084	.79176	.62456	.78098	.63810	.76996	21
40	.58307	.81242	.59716	.80212	.61107	.79158	.62479	.78079	.63832	.76977	20
41	.58330	.81225	.59739	.80195	.61130	.79140	.62502	.78061	.63854	.76959	19
42	.58354	.81208	.59763	.80178	.61153	.79122	.62524	.78043	.63877	.76940	18
43	.58378	.81191	.59786	.80160	.61176	.79105	.62547	.78025	.63899	.76921	17
44	.58401	.81174	.59809	.80143	.61199	.79087	.62570	.78007	.63922	.76903	16
45	.58425	.81157	.59832	.80125	.61222	.79069	.62592	.77988	.63944	.76884	15
46	.58449	.81140	.59856	.80108	.61245	.79051	.62615	.77970	.63966	.76866	14
47	.58472	.81123	.59879	.80091	.61268	.79033	.62638	.77952	.63989	.76847	13
48	.58496	.81106	.59902	.80073	.61291	.79016	.62660	.77934	.64011	.76828	12
49	.58519	.81089	.59926	.80056	.61314	.78998	.62683	.77916	.64033	.76810	11
50	.58543	.81072	.59949	.80038	.61337	.78980	.62706	.77897	.64056	.76791	10
51	.58567	.81055	.59972	.80021	.61360	.78962	.62728	.77879	.64078	.76772	9
52	.58590	.81038	.59995	.80003	.61383	.78944	.62751	.77861	.64100	.76754	8
53	.58614	.81021	.60019	.79986	.61406	.78926	.62774	.77843	.64123	.76735	7
54	.58637	.81004	.60042	.79968	.61429	.78908	.62796	.77824	.64145	.76717	6
55	.58661	.80987	.60065	.79951	.61451	.78891	.62819	.77806	.64167	.76698	5
56	.58684	.80970	.60089	.79934	.61474	.78873	.62842	.77788	.64190	.76679	4
57	.58708	.80953	.60112	.79916	.61497	.78855	.62864	.77769	.64212	.76661	3
58	.58731	.80936	.60135	.79899	.61520	.78837	.62887	.77751	.64234	.76642	2
59	.58755	.80919	.60158	.79881	.61543	.78819	.62909	.77733	.64256	.76623	1
60	.58779	.80902	.60182	.79864	.61566	.78801	.62932	.77715	.64279	.76604	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	54°		53°		52°		51°		50°		

TABLE 7.—NATURAL SINES AND COSINES.

′	40°		41°		42°		43°		44°		′
	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	
0	.64279	.76604	.65606	.75471	.66913	.74314	.68200	.73135	.69466	.71934	60
1	.64301	.76586	.65628	.75452	.66935	.74295	.68221	.73116	.69487	.71914	59
2	.64323	.76567	.65650	.75433	.66956	.74276	.68242	.73096	.69508	.71894	58
3	.64346	.76548	.65672	.75414	.66978	.74256	.68264	.73076	.69529	.71873	57
4	.64368	.76530	.65694	.75395	.66999	.74237	.68285	.73056	.69549	.71853	56
5	.64390	.76511	.65716	.75375	.67021	.74217	.68306	.73036	.69570	.71833	55
6	.64412	.76492	.65738	.75356	.67043	.74198	.68327	.73016	.69591	.71813	54
7	.64435	.76473	.65759	.75337	.67064	.74178	.68349	.72996	.69612	.71792	53
8	.64457	.76455	.65781	.75318	.67086	.74159	.68370	.72976	.69633	.71772	52
9	.64479	.76436	.65803	.75299	.67107	.74139	.68391	.72957	.69654	.71752	51
10	.64501	.76417	.65825	.75280	.67129	.74120	.68412	.72937	.69675	.71732	50
11	.64524	.76398	.65847	.75261	.67151	.74100	.68434	.72917	.69696	.71711	49
12	.64546	.76380	.65869	.75241	.67172	.74080	.68455	.72897	.69717	.71691	48
13	.64568	.76361	.65891	.75222	.67194	.74061	.68476	.72877	.69737	.71671	47
14	.64590	.76342	.65913	.75203	.67215	.74041	.68497	.72857	.69758	.71650	46
15	.64612	.76323	.65935	.75184	.67237	.74022	.68518	.72837	.69779	.71630	45
16	.64635	.76304	.65956	.75165	.67258	.74002	.68539	.72817	.69800	.71610	44
17	.64657	.76286	.65978	.75146	.67280	.73983	.68561	.72797	.69821	.71590	43
18	.64679	.76267	.66000	.75126	.67301	.73963	.68582	.72777	.69842	.71569	42
19	.64701	.76248	.66022	.75107	.67323	.73944	.68603	.72757	.69862	.71549	41
20	.64723	.76229	.66044	.75088	.67344	.73924	.68624	.72737	.69883	.71529	40
21	.64746	.76210	.66066	.75069	.67366	.73904	.68645	.72717	.69904	.71508	39
22	.64768	.76192	.66088	.75050	.67387	.73885	.68666	.72697	.69925	.71488	38
23	.64790	.76173	.66109	.75030	.67409	.73865	.68688	.72677	.69946	.71468	37
24	.64812	.76154	.66131	.75011	.67430	.73846	.68709	.72657	.69966	.71447	36
25	.64834	.76135	.66153	.74992	.67452	.73826	.68730	.72637	.69987	.71427	35
26	.64856	.76116	.66175	.74973	.67473	.73806	.68751	.72617	.70008	.71407	34
27	.64878	.76097	.66197	.74953	.67495	.73787	.68772	.72597	.70029	.71386	33
28	.64901	.76078	.66218	.74934	.67516	.73767	.68793	.72577	.70049	.71366	32
29	.64923	.76059	.66240	.74915	.67538	.73747	.68814	.72557	.70070	.71345	31
30	.64945	.76041	.66262	.74896	.67559	.73728	.68835	.72537	.70091	.71325	30
31	.64967	.76022	.66284	.74876	.67580	.73708	.68857	.72517	.70112	.71305	29
32	.64989	.76003	.66306	.74857	.67602	.73688	.68878	.72497	.70132	.71284	28
33	.65011	.75984	.66327	.74838	.67623	.73669	.68899	.72477	.70153	.71264	27
34	.65033	.75965	.66349	.74818	.67645	.73649	.68920	.72457	.70174	.71243	26
35	.65055	.75946	.66371	.74799	.67666	.73629	.68941	.72437	.70195	.71223	25
36	.65077	.75927	.66393	.74780	.67688	.73610	.68962	.72417	.70215	.71203	24
37	.65100	.75908	.66414	.74760	.67709	.73590	.68983	.72397	.70236	.71182	23
38	.65122	.75889	.66436	.74741	.67730	.73570	.69004	.72377	.70257	.71162	22
39	.65144	.75870	.66458	.74722	.67752	.73551	.69025	.72357	.70277	.71141	21
40	.65166	.75851	.66480	.74703	.67773	.73531	.69046	.72337	.70298	.71121	20
41	.65188	.75832	.66501	.74683	.67795	.73511	.69067	.72317	.70319	.71100	19
42	.65210	.75813	.66523	.74664	.67816	.73491	.69088	.72297	.70339	.71080	18
43	.65232	.75794	.66545	.74644	.67837	.73472	.69109	.72277	.70360	.71059	17
44	.65254	.75775	.66566	.74625	.67859	.73452	.69130	.72257	.70381	.71039	16
45	.65276	.75756	.66588	.74606	.67880	.73432	.69151	.72236	.70401	.71019	15
46	.65298	.75738	.66610	.74586	.67901	.73413	.69172	.72216	.70422	.70998	14
47	.65320	.75719	.66632	.74567	.67923	.73393	.69193	.72196	.70443	.70978	13
48	.65342	.75700	.66653	.74548	.67944	.73373	.69214	.72176	.70463	.70957	12
49	.65364	.75680	.66675	.74528	.67965	.73353	.69235	.72156	.70484	.70937	11
50	.65386	.75661	.66697	.74509	.67987	.73333	.69256	.72136	.70505	.70916	10
51	.65408	.75642	.66718	.74489	.68008	.73314	.69277	.72116	.70525	.70896	9
52	.65430	.75623	.66740	.74470	.68029	.73294	.69298	.72095	.70546	.70875	8
53	.65452	.75604	.66762	.74451	.68051	.73274	.69319	.72075	.70567	.70855	7
54	.65474	.75585	.66783	.74431	.68072	.73254	.69340	.72055	.70587	.70834	6
55	.65496	.75566	.66805	.74412	.68093	.73234	.69361	.72035	.70608	.70813	5
56	.65518	.75547	.66827	.74392	.68115	.73215	.69382	.72015	.70628	.70793	4
57	.65540	.75528	.66848	.74373	.68136	.73195	.69403	.71995	.70649	.70772	3
58	.65562	.75509	.66870	.74353	.68157	.73175	.69424	.71974	.70670	.70752	2
59	.65584	.75490	.66891	.74334	.68179	.73155	.69445	.71954	.70690	.70731	1
60	.65606	.75471	.66913	.74314	.68200	.73135	.69466	.71934	.70711	.70711	0
′	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	Cosin.	Sine.	′
	49°		48°		47°		46°		45°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	0°		1°		2°		3°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.00000	Infinite.	.01746	57.2900	.03492	28.6363	.05241	19.0811	60
1	.00029	3437.75	.01775	56.3506	.03521	28.3994	.05270	18.9755	59
2	.00058	1718.87	.01804	55.4415	.03550	28.1664	.05299	18.8711	58
3	.00087	1145.92	.01833	54.5613	.03579	27.9372	.05328	18.7678	57
4	.00116	859.436	.01862	53.7086	.03609	27.7117	.05357	18.6656	56
5	.00145	687.549	.01891	52.8821	.03638	27.4899	.05387	18.5645	55
6	.00175	572.957	.01920	52.0807	.03667	27.2715	.05416	18.4645	54
7	.00204	491.106	.01949	51.3032	.03696	27.0566	.05445	18.3655	53
8	.00233	429.718	.01978	50.5485	.03725	26.8450	.05474	18.2677	52
9	.00262	381.971	.02007	49.8157	.03754	26.6367	.05503	18.1708	51
10	.00291	343.774	.02036	49.1039	.03783	26.4316	.05533	18.0750	50
11	.00320	312.521	.02066	48.4121	.03812	26.2296	.05562	17.9802	49
12	.00349	286.478	.02095	47.7395	.03842	26.0307	.05591	17.8863	48
13	.00378	264.441	.02124	47.0853	.03871	25.8348	.05620	17.7934	47
14	.00407	245.552	.02153	46.4489	.03900	25.6418	.05649	17.7015	46
15	.00436	229.182	.02182	45.8294	.03929	25.4517	.05678	17.6106	45
16	.00465	214.858	.02211	45.2261	.03958	25.2644	.05708	17.5205	44
17	.00495	202.219	.02240	44.6386	.03987	25.0798	.05737	17.4314	43
18	.00524	190.984	.02269	44.0661	.04016	24.8978	.05766	17.3432	42
19	.00553	180.932	.02298	43.5081	.04046	24.7185	.05795	17.2558	41
20	.00582	171.885	.02328	42.9641	.04075	24.5418	.05824	17.1693	40
21	.00611	163.700	.02357	42.4335	.04104	24.3675	.05854	17.0837	39
22	.00640	156.259	.02386	41.9158	.04133	24.1957	.05883	16.9990	38
23	.00669	149.465	.02415	41.4106	.04162	24.0263	.05912	16.9150	37
24	.00698	143.237	.02444	40.9174	.04191	23.8593	.05941	16.8319	36
25	.00727	137.507	.02473	40.4358	.04220	23.6945	.05970	16.7496	35
26	.00756	132.219	.02502	39.9655	.04250	23.5321	.05999	16.6681	34
27	.00785	127.321	.02531	39.5059	.04279	23.3718	.06029	16.5874	33
28	.00815	122.774	.02560	39.0568	.04308	23.2137	.06058	16.5075	32
29	.00844	118.540	.02589	38.6177	.04337	23.0577	.06087	16.4283	31
30	.00873	114.589	.02619	38.1885	.04366	22.9038	.06116	16.3499	30
31	.00902	110.892	.02648	37.7686	.04395	22.7519	.06145	16.2722	29
32	.00931	107.426	.02677	37.3579	.04424	22.6020	.06175	16.1952	28
33	.00960	104.171	.02706	36.9560	.04454	22.4541	.06204	16.1190	27
34	.00989	101.107	.02735	36.5627	.04483	22.3081	.06233	16.0435	26
35	.01018	98.2179	.02764	36.1776	.04512	22.1640	.06262	15.9687	25
36	.01047	95.4895	.02793	35.8006	.04541	22.0217	.06291	15.8945	24
37	.01076	92.9085	.02822	35.4313	.04570	21.8813	.06321	15.8211	23
38	.01105	90.4633	.02851	35.0695	.04599	21.7426	.06350	15.7483	22
39	.01135	88.1436	.02881	34.7151	.04628	21.6056	.06379	15.6762	21
40	.01164	85.9398	.02910	34.3678	.04658	21.4704	.06408	15.6048	20
41	.01193	83.8435	.02939	34.0273	.04687	21.3369	.06437	15.5340	19
42	.01222	81.8470	.02968	33.6935	.04716	21.2049	.06467	15.4638	18
43	.01251	79.9434	.02997	33.3662	.04745	21.0747	.06496	15.3943	17
44	.01280	78.1263	.03026	33.0452	.04774	20.9460	.06525	15.3254	16
45	.01309	76.3900	.03055	32.7303	.04803	20.8188	.06554	15.2571	15
46	.01338	74.7292	.03084	32.4213	.04833	20.6932	.06584	15.1893	14
47	.01367	73.1390	.03114	32.1181	.04862	20.5691	.06613	15.1222	13
48	.01396	71.6151	.03143	31.8205	.04891	20.4465	.06642	15.0557	12
49	.01425	70.1533	.03172	31.5284	.04920	20.3253	.06671	14.9898	11
50	.01455	68.7501	.03201	31.2416	.04949	20.2056	.06700	14.9244	10
51	.01484	67.4019	.03230	30.9599	.04978	20.0872	.06730	14.8596	9
52	.01513	66.1055	.03259	30.6833	.05007	19.9702	.06759	14.7954	8
53	.01542	64.8580	.03288	30.4116	.05037	19.8546	.06788	14.7317	7
54	.01571	63.6567	.03317	30.1446	.05066	19.7403	.06817	14.6685	6
55	.01600	62.4992	.03346	29.8823	.05095	19.6273	.06847	14.6059	5
56	.01629	61.3829	.03376	29.6245	.05124	19.5156	.06876	14.5438	4
57	.01658	60.3058	.03405	29.3711	.05153	19.4051	.06905	14.4823	3
58	.01687	59.2659	.03434	29.1220	.05182	19.2959	.06934	14.4212	2
59	.01716	58.2612	.03463	28.8771	.05212	19.1879	.06963	14.3607	1
60	.01746	57.2900	.03492	28.6363	.05241	19.0811	.06993	14.3007	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	89°		88°		87°		86°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	4°		5°		6°		7°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.06993	14.3007	.08749	11.4301	.10510	9.51436	.12278	8.14435	60
1	.07022	14.2411	.08778	11.3919	.10540	9.48781	.12308	8.12481	59
2	.07051	14.1821	.08807	11.3540	.10569	9.46141	.12338	8.10536	58
3	.07080	14.1235	.08837	11.3163	.10599	9.43515	.12367	8.08600	57
4	.07110	14.0655	.08866	11.2789	.10628	9.40904	.12397	8.06674	56
5	.07139	14.0079	.08895	11.2417	.10657	9.38307	.12426	8.04756	55
6	.07168	13.9507	.08925	11.2048	.10687	9.35724	.12456	8.02848	54
7	.07197	13.8940	.08954	11.1681	.10716	9.33155	.12485	8.00948	53
8	.07227	13.8378	.08983	11.1316	.10746	9.30599	.12515	7.99058	52
9	.07256	13.7821	.09013	11.0954	.10775	9.28058	.12544	7.97176	51
10	.07285	13.7267	.09042	11.0594	.10805	9.25530	.12574	7.95302	50
11	.07314	13.6719	.09071	11.0237	.10834	9.23016	.12603	7.93438	49
12	.07344	13.6174	.09101	10.9882	.10863	9.20516	.12633	7.91582	48
13	.07373	13.5634	.09130	10.9529	.10893	9.18028	.12662	7.89734	47
14	.07402	13.5098	.09159	10.9178	.10922	9.15554	.12692	7.87895	46
15	.07431	13.4566	.09189	10.8829	.10952	9.13093	.12722	7.86064	45
16	.07461	13.4039	.09218	10.8483	.10981	9.10646	.12751	7.84242	44
17	.07490	13.3515	.09247	10.8139	.11011	9.08211	.12781	7.82428	43
18	.07519	13.2996	.09277	10.7797	.11040	9.05789	.12810	7.80622	42
19	.07548	13.2480	.09306	10.7457	.11070	9.03379	.12840	7.78825	41
20	.07578	13.1969	.09335	10.7119	.11099	9.00983	.12869	7.77035	40
21	.07607	13.1461	.09365	10.6783	.11128	8.98598	.12899	7.75254	39
22	.07636	13.0958	.09394	10.6450	.11158	8.96227	.12929	7.73480	38
23	.07665	13.0458	.09423	10.6118	.11187	8.93867	.12958	7.71715	37
24	.07695	12.9962	.09453	10.5789	.11217	8.91520	.12988	7.69957	36
25	.07724	12.9469	.09482	10.5462	.11246	8.89185	.13017	7.68208	35
26	.07753	12.8981	.09511	10.5136	.11276	8.86862	.13047	7.66466	34
27	.07782	12.8496	.09541	10.4813	.11305	8.84551	.13076	7.64732	33
28	.07812	12.8014	.09570	10.4491	.11335	8.82252	.13106	7.63005	32
29	.07841	12.7536	.09600	10.4172	.11364	8.79964	.13136	7.61287	31
30	.07870	12.7062	.09629	10.3854	.11394	8.77689	.13165	7.59575	30
31	.07899	12.6591	.09658	10.3538	.11423	8.75425	.13195	7.57872	29
32	.07929	12.6124	.09688	10.3224	.11452	8.73172	.13224	7.56176	28
33	.07958	12.5660	.09717	10.2913	.11482	8.70931	.13254	7.54487	27
34	.07987	12.5199	.09746	10.2602	.11511	8.68701	.13284	7.52806	26
35	.08017	12.4742	.09776	10.2294	.11541	8.66482	.13313	7.51132	25
36	.08046	12.4288	.09805	10.1988	.11570	8.64275	.13343	7.49465	24
37	.08075	12.3838	.09834	10.1683	.11600	8.62078	.13372	7.47806	23
38	.08104	12.3390	.09864	10.1381	.11629	8.59893	.13402	7.46154	22
39	.08134	12.2946	.09893	10.1080	.11659	8.57718	.13432	7.44509	21
40	.08163	12.2505	.09923	10.0780	.11688	8.55555	.13461	7.42871	20
41	.08192	12.2067	.09952	10.0483	.11718	8.53402	.13491	7.41240	19
42	.08221	12.1632	.09981	10.0187	.11747	8.51259	.13521	7.39616	18
43	.08251	12.1201	.10011	9.98931	.11777	8.49128	.13550	7.37999	17
44	.08280	12.0772	.10040	9.96007	.11806	8.47007	.13580	7.36389	16
45	.08309	12.0346	.10069	9.93101	.11836	8.44896	.13609	7.34786	15
46	.08339	11.9923	.10099	9.90211	.11865	8.42795	.13639	7.33190	14
47	.08368	11.9504	.10128	9.87338	.11895	8.40705	.13669	7.31600	13
48	.08397	11.9087	.10158	9.84482	.11924	8.38625	.13698	7.30018	12
49	.08427	11.8673	.10187	9.81641	.11954	8.36555	.13728	7.28442	11
50	.08456	11.8262	.10216	9.78817	.11983	8.34496	.13758	7.26873	10
51	.08485	11.7853	.10246	9.76009	.12013	8.32446	.13787	7.25310	9
52	.08514	11.7448	.10275	9.73217	.12042	8.30406	.13817	7.23754	8
53	.08544	11.7045	.10305	9.70441	.12072	8.28376	.13846	7.22204	7
54	.08573	11.6645	.10334	9.67680	.12101	8.26355	.13876	7.20661	6
55	.08602	11.6248	.10363	9.64935	.12131	8.24345	.13906	7.19125	5
56	.08632	11.5853	.10393	9.62205	.12160	8.22344	.13935	7.17594	4
57	.08661	11.5461	.10422	9.59490	.12190	8.20352	.13965	7.16071	3
58	.08690	11.5072	.10452	9.56791	.12219	8.18370	.13995	7.14553	2
59	.08720	11.4685	.10481	9.54106	.12249	8.16398	.14024	7.13042	1
60	.08749	11.4301	.10510	9.51436	.12278	8.14435	.14054	7.11537	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	85°		84°		83°		82°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	8°		9°		10°		11°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.14054	7.11537	.15838	6.31375	.17633	5.67128	.19438	5.14455	60
1	.14084	7.10038	.15868	6.30189	.17663	5.66165	.19468	5.13658	59
2	.14113	7.08546	.15898	6.29007	.17693	5.65205	.19498	5.12862	58
3	.14143	7.07059	.15928	6.27829	.17723	5.64248	.19529	5.12069	57
4	.14173	7.05579	.15958	6.26655	.17753	5.63295	.19559	5.11279	56
5	.14202	7.04105	.15988	6.25486	.17783	5.62344	.19589	5.10490	55
6	.14232	7.02637	.16017	6.24321	.17813	5.61397	.19619	5.09704	54
7	.14262	7.01174	.16047	6.23160	.17843	5.60452	.19649	5.08921	53
8	.14291	6.99718	.16077	6.22003	.17873	5.59511	.19680	5.08139	52
9	.14321	6.98268	.16107	6.20851	.17903	5.58573	.19710	5.07360	51
10	.14351	6.96823	.16137	6.19703	.17933	5.57638	.19740	5.06584	50
11	.14381	6.95385	.16167	6.18559	.17963	5.56706	.19770	5.05809	49
12	.14410	6.93952	.16196	6.17419	.17993	5.55777	.19801	5.05037	48
13	.14440	6.92525	.16226	6.16283	.18023	5.54851	.19831	5.04267	47
14	.14470	6.91104	.16256	6.15151	.18053	5.53927	.19861	5.03499	46
15	.14499	6.89688	.16286	6.14023	.18083	5.53007	.19891	5.02734	45
16	.14529	6.88278	.16316	6.12899	.18113	5.52090	.19921	5.01971	44
17	.14559	6.86874	.16346	6.11779	.18143	5.51176	.19952	5.01210	43
18	.14588	6.85475	.16376	6.10664	.18173	5.50264	.19982	5.00451	42
19	.14618	6.84082	.16405	6.09552	.18203	5.49356	.20012	4.99695	41
20	.14648	6.82694	.16435	6.08444	.18233	5.48451	.20042	4.98940	40
21	.14678	6.81312	.16465	6.07340	.18263	5.47548	.20073	4.98188	39
22	.14707	6.79936	.16495	6.06240	.18293	5.46648	.20103	4.97438	38
23	.14737	6.78564	.16525	6.05143	.18323	5.45751	.20133	4.96690	37
24	.14767	6.77199	.16555	6.04051	.18353	5.44857	.20164	4.95945	36
25	.14796	6.75838	.16585	6.02962	.18384	5.43966	.20194	4.95201	35
26	.14826	6.74483	.16615	6.01878	.18414	5.43077	.20224	4.94460	34
27	.14856	6.73133	.16645	6.00797	.18444	5.42192	.20254	4.93721	33
28	.14886	6.71789	.16674	5.99720	.18474	5.41309	.20285	4.92984	32
29	.14915	6.70450	.16704	5.98646	.18504	5.40429	.20315	4.92249	31
30	.14945	6.69116	.16734	5.97576	.18534	5.39552	.20345	4.91516	30
31	.14975	6.67787	.16764	5.96510	.18564	5.38677	.20376	4.90785	29
32	.15005	6.66463	.16794	5.95448	.18594	5.37805	.20406	4.90056	28
33	.15034	6.65144	.16824	5.94390	.18624	5.36936	.20436	4.89330	27
34	.15064	6.63831	.16854	5.93335	.18654	5.36070	.20466	4.88605	26
35	.15094	6.62523	.16884	5.92283	.18684	5.35206	.20497	4.87882	25
36	.15124	6.61219	.16914	5.91236	.18714	5.34345	.20527	4.87162	24
37	.15153	6.59921	.16944	5.90191	.18745	5.33487	.20557	4.86444	23
38	.15183	6.58627	.16974	5.89151	.18775	5.32631	.20588	4.85727	22
39	.15213	6.57339	.17004	5.88114	.18805	5.31778	.20618	4.85013	21
40	.15243	6.56055	.17033	5.87080	.18835	5.30928	.20648	4.84300	20
41	.15272	6.54777	.17063	5.86051	.18865	5.30080	.20679	4.83590	19
42	.15302	6.53503	.17093	5.85024	.18895	5.29235	.20709	4.82882	18
43	.15332	6.52234	.17123	5.84001	.18925	5.28393	.20739	4.82175	17
44	.15362	6.50970	.17153	5.82982	.18955	5.27553	.20770	4.81471	16
45	.15391	6.49710	.17183	5.81966	.18986	5.26715	.20800	4.80769	15
46	.15421	6.48456	.17213	5.80953	.19016	5.25880	.20830	4.80068	14
47	.15451	6.47206	.17243	5.79944	.19046	5.25048	.20861	4.79370	13
48	.15481	6.45961	.17273	5.78938	.19076	5.24218	.20891	4.78673	12
49	.15511	6.44720	.17303	5.77936	.19106	5.23391	.20921	4.77978	11
50	.15540	6.43484	.17333	5.76937	.19136	5.22566	.20952	4.77286	10
51	.15570	6.42253	.17363	5.75941	.19166	5.21744	.20982	4.76595	9
52	.15600	6.41026	.17393	5.74949	.19197	5.20925	.21013	4.75906	8
53	.15630	6.39804	.17423	5.73960	.19227	5.20107	.21043	4.75219	7
54	.15660	6.38587	.17453	5.72974	.19257	5.19293	.21073	4.74534	6
55	.15689	6.37374	.17483	5.71992	.19287	5.18480	.21104	4.73851	5
56	.15719	6.36165	.17513	5.71013	.19317	5.17671	.21134	4.73170	4
57	.15749	6.34961	.17543	5.70037	.19347	5.16863	.21164	4.72490	3
58	.15779	6.33761	.17573	5.69064	.19378	5.16058	.21195	4.71813	2
59	.15809	6.32566	.17603	5.68094	.19408	5.15256	.21225	4.71137	1
60	.15838	6.31375	.17633	5.67128	.19438	5.14455	.21256	4.70463	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	81°		80°		79°		78°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	12°		13°		14°		15°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.21256	4.70463	.23087	4.33148	.24933	4.01078	.26795	3.73205	60
1	.21286	4.69791	.23117	4.32573	.24964	4.00582	.26826	3.72771	59
2	.21316	4.69121	.23148	4.32001	.24995	4.00086	.26857	3.72338	58
3	.21347	4.68452	.23179	4.31430	.25026	3.99592	.26888	3.71907	57
4	.21377	4.67786	.23209	4.30860	.25056	3.99099	.26920	3.71476	56
5	.21408	4.67121	.23240	4.30291	.25087	3.98607	.26951	3.71046	55
6	.21438	4.66458	.23271	4.29724	.25118	3.98117	.26982	3.70616	54
7	.21469	4.65797	.23301	4.29159	.25149	3.97627	.27013	3.70188	53
8	.21499	4.65138	.23332	4.28595	.25180	3.97139	.27044	3.69761	52
9	.21529	4.64480	.23363	4.28032	.25211	3.96651	.27076	3.69335	51
10	.21560	4.63825	.23393	4.27471	.25242	3.96165	.27107	3.68909	50
11	.21590	4.63171	.23424	4.26911	.25273	3.95680	.27138	3.68485	49
12	.21621	4.62518	.23455	4.26352	.25304	3.95196	.27169	3.68061	48
13	.21651	4.61868	.23485	4.25795	.25335	3.94713	.27201	3.67638	47
14	.21682	4.61219	.23516	4.25239	.25366	3.94232	.27232	3.67217	46
15	.21712	4.60572	.23547	4.24685	.25397	3.93751	.27263	3.66796	45
16	.21743	4.59927	.23578	4.24132	.25428	3.93271	.27294	3.66376	44
17	.21773	4.59283	.23608	4.23580	.25459	3.92793	.27326	3.65957	43
18	.21804	4.58641	.23639	4.23030	.25490	3.92316	.27357	3.65538	42
19	.21834	4.58001	.23670	4.22481	.25521	3.91839	.27388	3.65121	41
20	.21864	4.57363	.23700	4.21933	.25552	3.91364	.27419	3.64705	40
21	.21895	4.56726	.23731	4.21387	.25583	3.90890	.27451	3.64289	39
22	.21925	4.56091	.23762	4.20842	.25614	3.90417	.27482	3.63874	38
23	.21956	4.55458	.23793	4.20298	.25645	3.89945	.27513	3.63461	37
24	.21986	4.54826	.23823	4.19756	.25676	3.89474	.27545	3.63048	36
25	.22017	4.54196	.23854	4.19215	.25707	3.89004	.27576	3.62636	35
26	.22047	4.53568	.23885	4.18675	.25738	3.88536	.27607	3.62224	34
27	.22078	4.52941	.23916	4.18137	.25769	3.88068	.27638	3.61814	33
28	.22108	4.52316	.23946	4.17600	.25800	3.87601	.27670	3.61405	32
29	.22139	4.51693	.23977	4.17064	.25831	3.87136	.27701	3.60996	31
30	.22169	4.51071	.24008	4.16530	.25862	3.86671	.27732	3.60588	30
31	.22200	4.50451	.24039	4.15997	.25893	3.86208	.27764	3.60181	29
32	.22231	4.49832	.24069	4.15465	.25924	3.85745	.27795	3.59775	28
33	.22261	4.49215	.24100	4.14934	.25955	3.85284	.27826	3.59370	27
34	.22292	4.48600	.24131	4.14405	.25986	3.84824	.27858	3.58966	26
35	.22322	4.47986	.24162	4.13877	.26017	3.84364	.27889	3.58562	25
36	.22353	4.47374	.24193	4.13350	.26048	3.83906	.27921	3.58160	24
37	.22383	4.46764	.24223	4.12825	.26079	3.83449	.27952	3.57758	23
38	.22414	4.46155	.24254	4.12301	.26110	3.82992	.27983	3.57357	22
39	.22444	4.45548	.24285	4.11778	.26141	3.82537	.28015	3.56957	21
40	.22475	4.44942	.24316	4.11256	.26172	3.82083	.28046	3.56557	20
41	.22505	4.44338	.24347	4.10736	.26203	3.81630	.28077	3.56159	19
42	.22536	4.43735	.24377	4.10216	.26235	3.81177	.28109	3.55761	18
43	.22567	4.43134	.24408	4.09699	.26266	3.80726	.28140	3.55364	17
44	.22597	4.42534	.24439	4.09182	.26297	3.80276	.28172	3.54968	16
45	.22628	4.41936	.24470	4.08666	.26328	3.79827	.28203	3.54573	15
46	.22658	4.41340	.24501	4.08152	.26359	3.79378	.28234	3.54179	14
47	.22689	4.40745	.24532	4.07639	.26390	3.78931	.28266	3.53785	13
48	.22719	4.40152	.24562	4.07127	.26421	3.78485	.28297	3.53393	12
49	.22750	4.39560	.24593	4.06616	.26452	3.78040	.28329	3.53001	11
50	.22781	4.38969	.24624	4.06107	.26483	3.77595	.28360	3.52609	10
51	.22811	4.38381	.24655	4.05599	.26515	3.77152	.28391	3.52219	9
52	.22842	4.37793	.24686	4.05092	.26546	3.76709	.28423	3.51829	8
53	.22872	4.37207	.24717	4.04586	.26577	3.76268	.28454	3.51441	7
54	.22903	4.36623	.24747	4.04081	.26608	3.75828	.28486	3.51053	6
55	.22934	4.36040	.24778	4.03578	.26639	3.75388	.28517	3.50666	5
56	.22964	4.35459	.24809	4.03076	.26670	3.74950	.28549	3.50279	4
57	.22995	4.34879	.24840	4.02574	.26701	3.74512	.28580	3.49894	3
58	.23026	4.34300	.24871	4.02074	.26733	3.74075	.28612	3.49509	2
59	.23056	4.33723	.24902	4.01576	.26764	3.73640	.28643	3.49125	1
60	.23087	4.33148	.24933	4.01078	.26795	3.73205	.28675	3.48741	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	77°		76°		75°		74°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	16°		17°		18°		19°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.28675	3.48741	.30573	3.27085	.32492	3.07768	.34433	2.90421	60
1	.28706	3.48359	.30605	3.26745	.32524	3.07464	.34465	2.90147	59
2	.28738	3.47977	.30637	3.26406	.32556	3.07160	.34498	2.89873	58
3	.28769	3.47596	.30669	3.26067	.32588	3.06857	.34530	2.89600	57
4	.28800	3.47216	.30700	3.25729	.32621	3.06554	.34563	2.89327	56
5	.28832	3.46837	.30732	3.25392	.32653	3.06252	.34596	2.89055	55
6	.28864	3.46458	.30764	3.25055	.32685	3.05950	.34628	2.88783	54
7	.28895	3.46080	.30796	3.24719	.32717	3.05649	.34661	2.88511	53
8	.28927	3.45703	.30828	3.24383	.32749	3.05349	.34693	2.88240	52
9	.28958	3.45327	.30860	3.24049	.32782	3.05049	.34726	2.87970	51
10	.28990	3.44951	.30891	3.23714	.32814	3.04749	.34758	2.87700	50
11	.29021	3.44576	.30923	3.23381	.32846	3.04450	.34791	2.87430	49
12	.29053	3.44202	.30955	3.23048	.32878	3.04152	.34824	2.87161	48
13	.29084	3.43829	.30987	3.22715	.32911	3.03854	.34856	2.86892	47
14	.29116	3.43456	.31019	3.22384	.32943	3.03556	.34889	2.86624	46
15	.29147	3.43084	.31051	3.22053	.32975	3.03260	.34922	2.86356	45
16	.29179	3.42713	.31083	3.21722	.33007	3.02963	.34954	2.86089	44
17	.29210	3.42343	.31115	3.21392	.33040	3.02667	.34987	2.85822	43
18	.29242	3.41973	.31147	3.21063	.33072	3.02372	.35020	2.85555	42
19	.29274	3.41604	.31178	3.20734	.33104	3.02077	.35052	2.85289	41
20	.29305	3.41236	.31210	3.20406	.33136	3.01783	.35085	2.85023	40
21	.29337	3.40869	.31242	3.20079	.33169	3.01489	.35118	2.84758	39
22	.29368	3.40502	.31274	3.19752	.33201	3.01196	.35150	2.84494	38
23	.29400	3.40136	.31306	3.19426	.33233	3.00903	.35183	2.84229	37
24	.29432	3.39771	.31338	3.19100	.33266	3.00611	.35216	2.83965	36
25	.29463	3.39406	.31370	3.18775	.33298	3.00319	.35248	2.83702	35
26	.29495	3.39042	.31402	3.18451	.33330	3.00028	.35281	2.83439	34
27	.29526	3.38679	.31434	3.18127	.33363	2.99738	.35314	2.83176	33
28	.29558	3.38317	.31466	3.17804	.33395	2.99447	.35346	2.82914	32
29	.29590	3.37955	.31498	3.17481	.33427	2.99158	.35379	2.82653	31
30	.29621	3.37594	.31530	3.17159	.33460	2.98868	.35412	2.82391	30
31	.29653	3.37234	.31562	3.16838	.33492	2.98580	.35445	2.82130	29
32	.29685	3.36875	.31594	3.16517	.33524	2.98292	.35477	2.81870	28
33	.29716	3.36516	.31626	3.16197	.33557	2.98004	.35510	2.81610	27
34	.29748	3.36158	.31658	3.15877	.33589	2.97717	.35543	2.81350	26
35	.29780	3.35800	.31690	3.15558	.33621	2.97430	.35576	2.81091	25
36	.29811	3.35443	.31722	3.15240	.33654	2.97144	.35608	2.80833	24
37	.29843	3.35087	.31754	3.14922	.33686	2.96858	.35641	2.80574	23
38	.29875	3.34732	.31786	3.14605	.33718	2.96573	.35674	2.80316	22
39	.29906	3.34377	.31818	3.14288	.33751	2.96288	.35707	2.80059	21
40	.29938	3.34023	.31850	3.13972	.33783	2.96004	.35740	2.79802	20
41	.29970	3.33670	.31882	3.13656	.33816	2.95721	.35772	2.79545	19
42	.30001	3.33317	.31914	3.13341	.33848	2.95437	.35805	2.79289	18
43	.30033	3.32965	.31946	3.13027	.33881	2.95155	.35838	2.79033	17
44	.30065	3.32614	.31978	3.12713	.33913	2.94872	.35871	2.78778	16
45	.30097	3.32264	.32010	3.12400	.33945	2.94591	.35904	2.78523	15
46	.30128	3.31914	.32042	3.12087	.33978	2.94309	.35937	2.78269	14
47	.30160	3.31565	.32074	3.11775	.34010	2.94028	.35969	2.78014	13
48	.30192	3.31216	.32106	3.11464	.34043	2.93748	.36002	2.77761	12
49	.30224	3.30868	.32139	3.11153	.34075	2.93468	.36035	2.77507	11
50	.30255	3.30521	.32171	3.10842	.34108	2.93189	.36068	2.77254	10
51	.30287	3.30174	.32203	3.10532	.34140	2.92910	.36101	2.77002	9
52	.30319	3.29829	.32235	3.10223	.34173	2.92632	.36134	2.76750	8
53	.30351	3.29483	.32267	3.09914	.34205	2.92354	.36167	2.76498	7
54	.30382	3.29139	.32299	3.09606	.34238	2.92076	.36199	2.76247	6
55	.30414	3.28795	.32331	3.09298	.34270	2.91799	.36232	2.75996	5
56	.30446	3.28452	.32363	3.08991	.34303	2.91523	.36265	2.75746	4
57	.30478	3.28109	.32396	3.08685	.34335	2.91246	.36298	2.75496	3
58	.30509	3.27767	.32428	3.08379	.34368	2.90971	.36331	2.75246	2
59	.30541	3.27426	.32460	3.08073	.34400	2.90696	.36364	2.74997	1
60	.30573	3.27085	.32492	3.07768	.34433	2.90421	.36397	2.74748	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	73°		72°		71°		70°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	20°		21°		22°		23°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.36397	2.74748	.38386	2.60509	.40403	2.47509	.42447	2.35585	60
1	.36430	2.74499	.38420	2.60283	.40436	2.47302	.42482	2.35395	59
2	.36463	2.74251	.38453	2.60057	.40470	2.47095	.42516	2.35205	58
3	.36496	2.74004	.38487	2.59831	.40504	2.46888	.42551	2.35015	57
4	.36529	2.73756	.38520	2.59606	.40538	2.46682	.42585	2.34825	56
5	.36562	2.73509	.38553	2.59381	.40572	2.46476	.42619	2.34636	55
6	.36595	2.73263	.38587	2.59156	.40606	2.46270	.42654	2.34447	54
7	.36628	2.73017	.38620	2.58932	.40640	2.46065	.42688	2.34258	53
8	.36661	2.72771	.38654	2.58708	.40674	2.45860	.42722	2.34069	52
9	.36694	2.72526	.38687	2.58484	.40707	2.45655	.42757	2.33881	51
10	.36727	2.72281	.38721	2.58261	.40741	2.45451	.42791	2.33693	50
11	.36760	2.72036	.38754	2.58038	.40775	2.45246	.42826	2.33505	49
12	.36793	2.71792	.38787	2.57815	.40809	2.45043	.42860	2.33317	48
13	.36826	2.71548	.38821	2.57593	.40843	2.44839	.42894	2.33130	47
14	.36859	2.71305	.38854	2.57371	.40877	2.44636	.42929	2.32943	46
15	.36892	2.71062	.38888	2.57150	.40911	2.44433	.42963	2.32756	45
16	.36925	2.70819	.38921	2.56928	.40945	2.44230	.42998	2.32570	44
17	.36958	2.70577	.38955	2.56707	.40979	2.44027	.43032	2.32383	43
18	.36991	2.70335	.38988	2.56487	.41013	2.43825	.43067	2.32197	42
19	.37024	2.70094	.39022	2.56266	.41047	2.43623	.43101	2.32012	41
20	.37057	2.69853	.39055	2.56046	.41081	2.43422	.43136	2.31826	40
21	.37090	2.69612	.39089	2.55827	.41115	2.43220	.43170	2.31641	39
22	.37123	2.69371	.39122	2.55608	.41149	2.43019	.43205	2.31456	38
23	.37157	2.69131	.39156	2.55389	.41183	2.42819	.43239	2.31271	37
24	.37190	2.68892	.39190	2.55170	.41217	2.42618	.43274	2.31086	36
25	.37223	2.68653	.39223	2.54952	.41251	2.42418	.43308	2.30902	35
26	.37256	2.68414	.39257	2.54734	.41285	2.42218	.43343	2.30718	34
27	.37289	2.68175	.39290	2.54516	.41319	2.42019	.43378	2.30534	33
28	.37322	2.67937	.39324	2.54299	.41353	2.41819	.43412	2.30351	32
29	.37355	2.67700	.39357	2.54082	.41387	2.41620	.43447	2.30167	31
30	.37388	2.67462	.39391	2.53865	.41421	2.41421	.43481	2.29984	30
31	.37422	2.67225	.39425	2.53648	.41455	2.41223	.43516	2.29801	29
32	.37455	2.66989	.39458	2.53432	.41490	2.41025	.43550	2.29619	28
33	.37488	2.66752	.39492	2.53217	.41524	2.40827	.43585	2.29437	27
34	.37521	2.66516	.39526	2.53001	.41558	2.40629	.43620	2.29254	26
35	.37554	2.66281	.39559	2.52786	.41592	2.40432	.43654	2.29073	25
36	.37588	2.66046	.39593	2.52571	.41626	2.40235	.43689	2.28891	24
37	.37621	2.65811	.39626	2.52357	.41660	2.40038	.43724	2.28710	23
38	.37654	2.65576	.39660	2.52142	.41694	2.39841	.43758	2.28528	22
39	.37687	2.65342	.39694	2.51929	.41728	2.39645	.43793	2.28348	21
40	.37720	2.65109	.39727	2.51715	.41763	2.39449	.43828	2.28167	20
41	.37754	2.64875	.39761	2.51502	.41797	2.39253	.43862	2.27987	19
42	.37787	2.64642	.39795	2.51289	.41831	2.39058	.43897	2.27806	18
43	.37820	2.64410	.39829	2.51076	.41865	2.38863	.43932	2.27626	17
44	.37853	2.64177	.39862	2.50864	.41899	2.38668	.43966	2.27447	16
45	.37887	2.63945	.39896	2.50652	.41933	2.38473	.44001	2.27267	15
46	.37920	2.63714	.39930	2.50440	.41968	2.38279	.44036	2.27088	14
47	.37953	2.63483	.39963	2.50229	.42002	2.38084	.44071	2.26909	13
48	.37986	2.63252	.39997	2.50018	.42036	2.37891	.44105	2.26730	12
49	.38020	2.63021	.40031	2.49807	.42070	2.37697	.44140	2.26552	11
50	.38053	2.62791	.40065	2.49597	.42105	2.37504	.44175	2.26374	10
51	.38086	2.62561	.40098	2.49386	.42139	2.37311	.44210	2.26196	9
52	.38120	2.62332	.40132	2.49177	.42173	2.37118	.44244	2.26018	8
53	.38153	2.62103	.40166	2.48967	.42207	2.36925	.44279	2.25840	7
54	.38186	2.61874	.40200	2.48758	.42242	2.36733	.44314	2.25663	6
55	.38220	2.61646	.40234	2.48549	.42276	2.36541	.44349	2.25486	5
56	.38253	2.61418	.40267	2.48340	.42310	2.36349	.44384	2.25309	4
57	.38286	2.61190	.40301	2.48132	.42345	2.36158	.44418	2.25132	3
58	.38320	2.60963	.40335	2.47924	.42379	2.35967	.44453	2.24956	2
59	.38353	2.60736	.40369	2.47716	.42413	2.35776	.44488	2.24780	1
60	.38386	2.60509	.40403	2.47509	.42447	2.35585	.44523	2.24604	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	69°		68°		67°		66°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	24°		25°		26°		27°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.44523	2.24604	.46631	2.14451	.48773	2.05030	.50953	1.96261	60
1	.44558	2.24428	.46666	2.14288	.48809	2.04879	.50989	1.96120	59
2	.44593	2.24252	.46702	2.14125	.48845	2.04728	.51026	1.95979	58
3	.44627	2.24077	.46737	2.13963	.48881	2.04577	.51063	1.95838	57
4	.44662	2.23902	.46772	2.13801	.48917	2.04426	.51099	1.95698	56
5	.44697	2.23727	.46808	2.13639	.48953	2.04276	.51136	1.95557	55
6	.44732	2.23553	.46843	2.13477	.48989	2.04125	.51173	1.95417	54
7	.44767	2.23378	.46879	2.13316	.49026	2.03975	.51209	1.95277	53
8	.44802	2.23204	.46914	2.13154	.49062	2.03825	.51246	1.95137	52
9	.44837	2.23030	.46950	2.12993	.49098	2.03675	.51283	1.94997	51
10	.44872	2.22857	.46985	2.12832	.49134	2.03526	.51319	1.94858	50
11	.44907	2.22683	.47021	2.12671	.49170	2.03376	.51356	1.94718	49
12	.44942	2.22510	.47056	2.12511	.49206	2.03227	.51393	1.94579	48
13	.44977	2.22337	.47092	2.12350	.49242	2.03078	.51430	1.94440	47
14	.45012	2.22164	.47128	2.12190	.49278	2.02929	.51467	1.94301	46
15	.45047	2.21992	.47163	2.12030	.49315	2.02780	.51503	1.94162	45
16	.45082	2.21819	.47199	2.11871	.49351	2.02631	.51540	1.94023	44
17	.45117	2.21647	.47234	2.11711	.49387	2.02483	.51577	1.93885	43
18	.45152	2.21475	.47270	2.11552	.49423	2.02335	.51614	1.93746	42
19	.45187	2.21304	.47305	2.11392	.49459	2.02187	.51651	1.93608	41
20	.45222	2.21132	.47341	2.11233	.49495	2.02039	.51688	1.93470	40
21	.45257	2.20961	.47377	2.11075	.49532	2.01891	.51724	1.93332	39
22	.45292	2.20790	.47412	2.10916	.49568	2.01743	.51761	1.93195	38
23	.45327	2.20619	.47448	2.10758	.49604	2.01596	.51798	1.93057	37
24	.45362	2.20449	.47483	2.10600	.49640	2.01449	.51835	1.92920	36
25	.45397	2.20278	.47519	2.10442	.49677	2.01302	.51872	1.92782	35
26	.45432	2.20108	.47555	2.10284	.49713	2.01155	.51909	1.92645	34
27	.45467	2.19938	.47590	2.10126	.49749	2.01008	.51946	1.92508	33
28	.45502	2.19769	.47626	2.09969	.49786	2.00862	.51983	1.92371	32
29	.45538	2.19599	.47662	2.09811	.49822	2.00715	.52020	1.92235	31
30	.45573	2.19430	.47698	2.09654	.49858	2.00569	.52057	1.92098	30
31	.45608	2.19261	.47733	2.09498	.49894	2.00423	.52094	1.91962	29
32	.45643	2.19092	.47769	2.09341	.49931	2.00277	.52131	1.91826	28
33	.45678	2.18923	.47805	2.09184	.49967	2.00131	.52168	1.91690	27
34	.45713	2.18755	.47840	2.09028	.50004	1.99986	.52205	1.91554	26
35	.45748	2.18587	.47876	2.08872	.50040	1.99841	.52242	1.91418	25
36	.45784	2.18419	.47912	2.08716	.50076	1.99695	.52279	1.91282	24
37	.45819	2.18251	.47948	2.08560	.50113	1.99550	.52316	1.91147	23
38	.45854	2.18084	.47984	2.08405	.50149	1.99406	.52353	1.91012	22
39	.45889	2.17916	.48019	2.08250	.50185	1.99261	.52390	1.90876	21
40	.45924	2.17749	.48055	2.08094	.50222	1.99116	.52427	1.90741	20
41	.45960	2.17582	.48091	2.07939	.50258	1.98972	.52464	1.90607	19
42	.45995	2.17416	.48127	2.07785	.50295	1.98828	.52501	1.90472	18
43	.46030	2.17249	.48163	2.07630	.50331	1.98684	.52538	1.90337	17
44	.46065	2.17083	.48198	2.07476	.50368	1.98540	.52575	1.90203	16
45	.46101	2.16917	.48234	2.07321	.50404	1.98396	.52613	1.90069	15
46	.46136	2.16751	.48270	2.07167	.50441	1.98253	.52650	1.89935	14
47	.46171	2.16585	.48306	2.07014	.50477	1.98110	.52687	1.89801	13
48	.46206	2.16420	.48342	2.06860	.50514	1.97966	.52724	1.89667	12
49	.46242	2.16255	.48378	2.06706	.50550	1.97823	.52761	1.89533	11
50	.46277	2.16090	.48414	2.06553	.50587	1.97681	.52798	1.89400	10
51	.46312	2.15925	.48450	2.06400	.50623	1.97538	.52836	1.89266	9
52	.46348	2.15760	.48486	2.06247	.50660	1.97395	.52873	1.89133	8
53	.46383	2.15596	.48521	2.06094	.50696	1.97253	.52910	1.89000	7
54	.46418	2.15432	.48557	2.05942	.50733	1.97111	.52947	1.88867	6
55	.46454	2.15268	.48593	2.05790	.50769	1.96969	.52985	1.88734	5
56	.46489	2.15104	.48629	2.05637	.50806	1.96827	.53022	1.88602	4
57	.46525	2.14940	.48665	2.05485	.50843	1.96685	.53059	1.88469	3
58	.46560	2.14777	.48701	2.05333	.50879	1.96544	.53096	1.88337	2
59	.46595	2.14614	.48737	2.05182	.50916	1.96402	.53134	1.88205	1
60	.46631	2.14451	.48773	2.05030	.50953	1.96261	.53171	1.88073	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	65°		64°		63°		62°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	28°		29°		30°		31°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.53171	1.88073	.55431	1.80405	.57735	1.73205	.60086	1.66428	60
1	.53208	1.87941	.55469	1.80281	.57774	1.73089	.60126	1.66318	59
2	.53246	1.87809	.55507	1.80158	.57813	1.72973	.60165	1.66209	58
3	.53283	1.87677	.55545	1.80034	.57851	1.72857	.60205	1.66099	57
4	.53320	1.87546	.55583	1.79911	.57890	1.72741	.60245	1.65990	56
5	.53358	1.87415	.55621	1.79788	.57929	1.72625	.60284	1.65881	55
6	.53395	1.87283	.55659	1.79665	.57968	1.72509	.60324	1.65772	54
7	.53432	1.87152	.55697	1.79542	.58007	1.72393	.60364	1.65663	53
8	.53470	1.87021	.55736	1.79419	.58046	1.72278	.60403	1.65554	52
9	.53507	1.86891	.55774	1.79296	.58085	1.72163	.60443	1.65445	51
10	.53545	1.86760	.55812	1.79174	.58124	1.72047	.60483	1.65337	50
11	.53582	1.86630	.55850	1.79051	.58162	1.71932	.60522	1.65228	49
12	.53620	1.86499	.55888	1.78929	.58201	1.71817	.60562	1.65120	48
13	.53657	1.86369	.55926	1.78807	.58240	1.71702	.60602	1.65011	47
14	.53694	1.86239	.55964	1.78685	.58279	1.71588	.60642	1.64903	46
15	.53732	1.86109	.56003	1.78563	.58318	1.71473	.60681	1.64795	45
16	.53769	1.85979	.56041	1.78441	.58357	1.71358	.60721	1.64687	44
17	.53807	1.85850	.56079	1.78319	.58396	1.71244	.60761	1.64579	43
18	.53844	1.85720	.56117	1.78198	.58435	1.71129	.60801	1.64471	42
19	.53882	1.85591	.56156	1.78077	.58474	1.71015	.60841	1.64363	41
20	.53920	1.85462	.56194	1.77955	.58513	1.70901	.60881	1.64256	40
21	.53957	1.85333	.56232	1.77834	.58552	1.70787	.60921	1.64148	39
22	.53995	1.85204	.56270	1.77713	.58591	1.70673	.60960	1.64041	38
23	.54032	1.85075	.56309	1.77592	.58631	1.70560	.61000	1.63934	37
24	.54070	1.84946	.56347	1.77471	.58670	1.70446	.61040	1.63826	36
25	.54107	1.84818	.56385	1.77351	.58709	1.70332	.61080	1.63719	35
26	.54145	1.84689	.56424	1.77230	.58748	1.70219	.61120	1.63612	34
27	.54183	1.84561	.56462	1.77110	.58787	1.70106	.61160	1.63505	33
28	.54220	1.84433	.56501	1.76990	.58826	1.69992	.61200	1.63398	32
29	.54258	1.84305	.56539	1.76869	.58865	1.69879	.61240	1.63292	31
30	.54296	1.84177	.56577	1.76749	.58905	1.69766	.61280	1.63185	30
31	.54333	1.84049	.56616	1.76629	.58944	1.69653	.61320	1.63079	29
32	.54371	1.83922	.56654	1.76510	.58983	1.69541	.61360	1.62972	28
33	.54409	1.83794	.56693	1.76390	.59022	1.69428	.61400	1.62866	27
34	.54446	1.83667	.56731	1.76271	.59061	1.69316	.61440	1.62760	26
35	.54484	1.83540	.56769	1.76151	.59101	1.69203	.61480	1.62654	25
36	.54522	1.83413	.56808	1.76032	.59140	1.69091	.61520	1.62548	24
37	.54560	1.83286	.56846	1.75913	.59179	1.68979	.61561	1.62442	23
38	.54597	1.83159	.56885	1.75794	.59218	1.68866	.61601	1.62336	22
39	.54635	1.83033	.56923	1.75675	.59258	1.68754	.61641	1.62230	21
40	.54673	1.82906	.56962	1.75556	.59297	1.68643	.61681	1.62125	20
41	.54711	1.82780	.57000	1.75437	.59336	1.68531	.61721	1.62019	19
42	.54748	1.82654	.57039	1.75319	.59376	1.68419	.61761	1.61914	18
43	.54786	1.82528	.57078	1.75200	.59415	1.68308	.61801	1.61808	17
44	.54824	1.82402	.57116	1.75082	.59454	1.68196	.61842	1.61703	16
45	.54862	1.82276	.57155	1.74964	.59494	1.68085	.61882	1.61598	15
46	.54900	1.82150	.57193	1.74846	.59533	1.67974	.61922	1.61493	14
47	.54938	1.82025	.57232	1.74728	.59573	1.67863	.61962	1.61388	13
48	.54975	1.81899	.57271	1.74610	.59612	1.67752	.62003	1.61283	12
49	.55013	1.81774	.57309	1.74492	.59651	1.67641	.62043	1.61179	11
50	.55051	1.81649	.57348	1.74375	.59691	1.67530	.62083	1.61074	10
51	.55089	1.81524	.57386	1.74257	.59730	1.67419	.62124	1.60970	9
52	.55127	1.81399	.57425	1.74140	.59770	1.67309	.62164	1.60865	8
53	.55165	1.81274	.57464	1.74022	.59809	1.67198	.62204	1.60761	7
54	.55203	1.81150	.57503	1.73905	.59849	1.67088	.62245	1.60657	6
55	.55241	1.81025	.57541	1.73788	.59888	1.66978	.62285	1.60553	5
56	.55279	1.80901	.57580	1.73671	.59928	1.66867	.62325	1.60449	4
57	.55317	1.80777	.57619	1.73555	.59967	1.66757	.62366	1.60345	3
58	.55355	1.80653	.57657	1.73438	.60007	1.66647	.62406	1.60241	2
59	.55393	1.80529	.57696	1.73321	.60046	1.66538	.62446	1.60137	1
60	.55431	1.80405	.57735	1.73205	.60086	1.66428	.62487	1.60033	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	61°		60°		59°		58°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	32°		33°		34°		35°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.62487	1.60033	.64941	1.53986	.67451	1.48256	.70021	1.42815	60
1	.62527	1.59930	.64982	1.53888	.67493	1.48163	.70064	1.42726	59
2	.62568	1.59826	.65024	1.53791	.67536	1.48070	.70107	1.42638	58
3	.62608	1.59723	.65065	1.53693	.67578	1.47977	.70151	1.42550	57
4	.62649	1.59620	.65106	1.53595	.67620	1.47885	.70194	1.42462	56
5	.62689	1.59517	.65148	1.53497	.67663	1.47792	.70238	1.42374	55
6	.62730	1.59414	.65189	1.53400	.67705	1.47699	.70281	1.42286	54
7	.62770	1.59311	.65231	1.53302	.67748	1.47607	.70325	1.42198	53
8	.62811	1.59208	.65272	1.53205	.67790	1.47514	.70368	1.42110	52
9	.62852	1.59105	.65314	1.53107	.67832	1.47422	.70412	1.42022	51
10	.62892	1.59002	.65355	1.53010	.67875	1.47330	.70455	1.41934	50
11	.62933	1.58900	.65397	1.52913	.67917	1.47238	.70499	1.41847	49
12	.62973	1.58797	.65438	1.52816	.67960	1.47146	.70542	1.41759	48
13	.63014	1.58695	.65480	1.52719	.68002	1.47053	.70586	1.41672	47
14	.63055	1.58593	.65521	1.52622	.68045	1.46962	.70629	1.41584	46
15	.63095	1.58490	.65563	1.52525	.68088	1.46870	.70673	1.41497	45
16	.63136	1.58388	.65604	1.52429	.68130	1.46778	.70717	1.41409	44
17	.63177	1.58286	.65646	1.52332	.68173	1.46686	.70760	1.41322	43
18	.63217	1.58184	.65688	1.52235	.68215	1.46595	.70804	1.41235	42
19	.63258	1.58083	.65729	1.52139	.68258	1.46503	.70848	1.41148	41
20	.63299	1.57981	.65771	1.52043	.68301	1.46411	.70891	1.41061	40
21	.63340	1.57879	.65813	1.51946	.68343	1.46320	.70935	1.40974	39
22	.63380	1.57778	.65854	1.51850	.68386	1.46229	.70979	1.40887	38
23	.63421	1.57676	.65896	1.51754	.68429	1.46137	.71023	1.40800	37
24	.63462	1.57575	.65938	1.51658	.68471	1.46046	.71066	1.40714	36
25	.63503	1.57474	.65980	1.51562	.68514	1.45955	.71110	1.40627	35
26	.63544	1.57372	.66021	1.51466	.68557	1.45864	.71154	1.40540	34
27	.63584	1.57271	.66063	1.51370	.68600	1.45773	.71198	1.40454	33
28	.63625	1.57170	.66105	1.51275	.68642	1.45682	.71242	1.40367	32
29	.63666	1.57069	.66147	1.51179	.68685	1.45592	.71285	1.40281	31
30	.63707	1.56969	.66189	1.51084	.68728	1.45501	.71329	1.40195	30
31	.63748	1.56868	.66230	1.50988	.68771	1.45410	.71373	1.40109	29
32	.63789	1.56767	.66272	1.50893	.68814	1.45320	.71417	1.40022	28
33	.63830	1.56667	.66314	1.50797	.68857	1.45229	.71461	1.39936	27
34	.63871	1.56566	.66356	1.50702	.68900	1.45139	.71505	1.39850	26
35	.63912	1.56466	.66398	1.50607	.68942	1.45049	.71549	1.39764	25
36	.63953	1.56366	.66440	1.50512	.68985	1.44958	.71593	1.39679	24
37	.63994	1.56265	.66482	1.50417	.69028	1.44868	.71637	1.39593	23
38	.64035	1.56165	.66524	1.50322	.69071	1.44778	.71681	1.39507	22
39	.64076	1.56065	.66566	1.50228	.69114	1.44688	.71725	1.39421	21
40	.64117	1.55966	.66608	1.50133	.69157	1.44598	.71769	1.39336	20
41	.64158	1.55866	.66650	1.50038	.69200	1.44508	.71813	1.39250	19
42	.64199	1.55766	.66692	1.49944	.69243	1.44418	.71857	1.39165	18
43	.64240	1.55666	.66734	1.49849	.69286	1.44329	.71901	1.39079	17
44	.64281	1.55567	.66776	1.49755	.69329	1.44239	.71946	1.38994	16
45	.64322	1.55467	.66818	1.49661	.69372	1.44149	.71990	1.38909	15
46	.64363	1.55368	.66860	1.49566	.69416	1.44060	.72034	1.38824	14
47	.64404	1.55269	.66902	1.49472	.69459	1.43970	.72078	1.38738	13
48	.64446	1.55170	.66944	1.49378	.69502	1.43881	.72122	1.38653	12
49	.64487	1.55071	.66986	1.49284	.69545	1.43792	.72167	1.38568	11
50	.64528	1.54972	.67028	1.49190	.69588	1.43703	.72211	1.38484	10
51	.64569	1.54873	.67071	1.49097	.69631	1.43614	.72255	1.38399	9
52	.64610	1.54774	.67113	1.49003	.69675	1.43525	.72299	1.38314	8
53	.64652	1.54675	.67155	1.48909	.69718	1.43436	.72344	1.38229	7
54	.64693	1.54576	.67197	1.48816	.69761	1.43347	.72388	1.38145	6
55	.64734	1.54478	.67239	1.48722	.69804	1.43258	.72432	1.38060	5
56	.64775	1.54379	.67282	1.48629	.69847	1.43169	.72477	1.37976	4
57	.64817	1.54281	.67324	1.48536	.69891	1.43080	.72521	1.37891	3
58	.64858	1.54183	.67366	1.48442	.69934	1.42992	.72565	1.37807	2
59	.64899	1.54085	.67409	1.48349	.69977	1.42903	.72610	1.37722	1
60	.64941	1.53986	.67451	1.48256	.70021	1.42815	.72654	1.37638	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	57°		56°		55°		54°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	36°		37°		38°		39°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.72654	1.37638	.75355	1.32704	.78129	1.27994	.80978	1.23490	60
1	.72699	1.37554	.75401	1.32624	.78175	1.27917	.81027	1.23416	59
2	.72743	1.37470	.75447	1.32544	.78222	1.27841	.81075	1.23343	58
3	.72788	1.37386	.75492	1.32464	.78269	1.27764	.81123	1.23270	57
4	.72832	1.37302	.75538	1.32384	.78316	1.27688	.81171	1.23196	56
5	.72877	1.37218	.75584	1.32304	.78363	1.27611	.81220	1.23123	55
6	.72921	1.37134	.75629	1.32224	.78410	1.27535	.81268	1.23050	54
7	.72966	1.37050	.75675	1.32144	.78457	1.27458	.81316	1.22977	53
8	.73010	1.36967	.75721	1.32064	.78504	1.27382	.81364	1.22904	52
9	.73055	1.36883	.75767	1.31984	.78551	1.27306	.81413	1.22831	51
10	.73100	1.36800	.75812	1.31904	.78598	1.27230	.81461	1.22758	50
11	.73144	1.36716	.75858	1.31825	.78645	1.27153	.81510	1.22685	49
12	.73189	1.36633	.75904	1.31745	.78692	1.27077	.81558	1.22612	48
13	.73234	1.36549	.75950	1.31666	.78739	1.27001	.81606	1.22539	47
14	.73278	1.36466	.75996	1.31586	.78786	1.26925	.81655	1.22467	46
15	.73323	1.36383	.76042	1.31507	.78834	1.26849	.81703	1.22394	45
16	.73368	1.36300	.76088	1.31427	.78881	1.26774	.81752	1.22321	44
17	.73413	1.36217	.76134	1.31348	.78928	1.26698	.81800	1.22249	43
18	.73457	1.36134	.76180	1.31269	.78975	1.26622	.81849	1.22176	42
19	.73502	1.36051	.76226	1.31190	.79022	1.26546	.81898	1.22104	41
20	.73547	1.35968	.76272	1.31110	.79070	1.26471	.81946	1.22031	40
21	.73592	1.35885	.76318	1.31031	.79117	1.26395	.81995	1.21959	39
22	.73637	1.35802	.76364	1.30952	.79164	1.26319	.82044	1.21886	38
23	.73681	1.35719	.76410	1.30873	.79212	1.26244	.82092	1.21814	37
24	.73726	1.35637	.76456	1.30795	.79259	1.26169	.82141	1.21742	36
25	.73771	1.35554	.76502	1.30716	.79306	1.26093	.82190	1.21670	35
26	.73816	1.35472	.76548	1.30637	.79354	1.26018	.82238	1.21598	34
27	.73861	1.35389	.76594	1.30558	.79401	1.25943	.82287	1.21526	33
28	.73906	1.35307	.76640	1.30480	.79449	1.25867	.82336	1.21454	32
29	.73951	1.35224	.76686	1.30401	.79496	1.25792	.82385	1.21382	31
30	.73996	1.35142	.76733	1.30323	.79544	1.25717	.82434	1.21310	30
31	.74041	1.35060	.76779	1.30244	.79591	1.25642	.82483	1.21238	29
32	.74086	1.34978	.76825	1.30166	.79639	1.25567	.82531	1.21166	28
33	.74131	1.34896	.76871	1.30087	.79686	1.25492	.82580	1.21094	27
34	.74176	1.34814	.76918	1.30009	.79734	1.25417	.82629	1.21023	26
35	.74221	1.34732	.76964	1.29931	.79781	1.25343	.82678	1.20951	25
36	.74267	1.34650	.77010	1.29853	.79829	1.25268	.82727	1.20879	24
37	.74312	1.34568	.77057	1.29775	.79877	1.25193	.82776	1.20808	23
38	.74357	1.34487	.77103	1.29696	.79924	1.25118	.82825	1.20736	22
39	.74402	1.34405	.77149	1.29618	.79972	1.25044	.82874	1.20665	21
40	.74447	1.34323	.77196	1.29541	.80020	1.24969	.82923	1.20593	20
41	.74492	1.34242	.77242	1.29463	.80067	1.24895	.82972	1.20522	19
42	.74538	1.34160	.77289	1.29385	.80115	1.24820	.83022	1.20451	18
43	.74583	1.34079	.77335	1.29307	.80163	1.24746	.83071	1.20379	17
44	.74628	1.33998	.77382	1.29229	.80211	1.24672	.83120	1.20308	16
45	.74674	1.33916	.77428	1.29152	.80258	1.24597	.83169	1.20237	15
46	.74719	1.33835	.77475	1.29074	.80306	1.24523	.83218	1.20166	14
47	.74764	1.33754	.77521	1.28997	.80354	1.24449	.83268	1.20095	13
48	.74810	1.33673	.77568	1.28919	.80402	1.24375	.83317	1.20024	12
49	.74855	1.33592	.77615	1.28842	.80450	1.24301	.83366	1.19953	11
50	.74900	1.33511	.77661	1.28764	.80498	1.24227	.83415	1.19882	10
51	.74946	1.33430	.77708	1.28687	.80546	1.24153	.83465	1.19811	9
52	.74991	1.33349	.77754	1.28610	.80594	1.24079	.83514	1.19740	8
53	.75037	1.33268	.77801	1.28533	.80642	1.24005	.83564	1.19669	7
54	.75082	1.33187	.77848	1.28456	.80690	1.23931	.83613	1.19599	6
55	.75128	1.33107	.77895	1.28379	.80738	1.23858	.83662	1.19528	5
56	.75173	1.33026	.77941	1.28302	.80786	1.23784	.83712	1.19457	4
57	.75219	1.32946	.77988	1.28225	.80834	1.23710	.83761	1.19387	3
58	.75264	1.32865	.78035	1.28148	.80882	1.23637	.83811	1.19316	2
59	.75310	1.32785	.78082	1.28071	.80930	1.23563	.83860	1.19246	1
60	.75355	1.32704	.78129	1.27994	.80978	1.23490	.83910	1.19175	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	53°		52°		51°		50°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	40°		41°		42°		43°		′
	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	
0	.83910	1.19175	.86929	1.15037	.90040	1.11061	.93252	1.07237	60
1	.83960	1.19105	.86980	1.14969	.90093	1.10996	.93306	1.07174	59
2	.84009	1.19035	.87031	1.14902	.90146	1.10931	.93360	1.07112	58
3	.84059	1.18964	.87082	1.14834	.90199	1.10867	.93415	1.07049	57
4	.84108	1.18894	.87133	1.14767	.90251	1.10802	.93469	1.06987	56
5	.84158	1.18824	.87184	1.14699	.90304	1.10737	.93524	1.06925	55
6	.84208	1.18754	.87236	1.14632	.90357	1.10672	.93578	1.06862	54
7	.84258	1.18684	.87287	1.14565	.90410	1.10607	.93633	1.06800	53
8	.84307	1.18614	.87338	1.14498	.90463	1.10543	.93688	1.06738	52
9	.84357	1.18544	.87389	1.14430	.90516	1.10478	.93742	1.06676	51
10	.84407	1.18474	.87441	1.14363	.90569	1.10414	.93797	1.06613	50
11	.84457	1.18404	.87492	1.14296	.90621	1.10349	.93852	1.06551	49
12	.84507	1.18334	.87543	1.14229	.90674	1.10285	.93906	1.06489	48
13	.84556	1.18264	.87595	1.14162	.90727	1.10220	.93961	1.06427	47
14	.84606	1.18194	.87646	1.14095	.90781	1.10156	.94016	1.06365	46
15	.84656	1.18125	.87698	1.14028	.90834	1.10091	.94071	1.06303	45
16	.84706	1.18055	.87749	1.13961	.90887	1.10027	.94125	1.06241	44
17	.84756	1.17986	.87801	1.13894	.90940	1.09963	.94180	1.06179	43
18	.84806	1.17916	.87852	1.13828	.90993	1.09899	.94235	1.06117	42
19	.84856	1.17846	.87904	1.13761	.91046	1.09834	.94290	1.06056	41
20	.84906	1.17777	.87955	1.13694	.91099	1.09770	.94345	1.05994	40
21	.84956	1.17708	.88007	1.13627	.91153	1.09706	.94400	1.05932	39
22	.85006	1.17638	.88059	1.13561	.91206	1.09642	.94455	1.05870	38
23	.85057	1.17569	.88110	1.13494	.91259	1.09578	.94510	1.05809	37
24	.85107	1.17500	.88162	1.13428	.91313	1.09514	.94565	1.05747	36
25	.85157	1.17430	.88214	1.13361	.91366	1.09450	.94620	1.05685	35
26	.85207	1.17361	.88265	1.13295	.91419	1.09386	.94676	1.05624	34
27	.85257	1.17292	.88317	1.13228	.91473	1.09322	.94731	1.05562	33
28	.85308	1.17223	.88369	1.13162	.91526	1.09258	.94786	1.05501	32
29	.85358	1.17154	.88421	1.13096	.91580	1.09195	.94841	1.05439	31
30	.85408	1.17085	.88473	1.13029	.91633	1.09131	.94896	1.05378	30
31	.85458	1.17016	.88524	1.12963	.91687	1.09067	.94952	1.05317	29
32	.85509	1.16947	.88576	1.12897	.91740	1.09003	.95007	1.05255	28
33	.85559	1.16878	.88628	1.12831	.91794	1.08940	.95062	1.05194	27
34	.85609	1.16809	.88680	1.12765	.91847	1.08876	.95118	1.05133	26
35	.85660	1.16741	.88732	1.12699	.91901	1.08813	.95173	1.05072	25
36	.85710	1.16672	.88784	1.12633	.91955	1.08749	.95229	1.05010	24
37	.85761	1.16603	.88836	1.12567	.92008	1.08686	.95284	1.04949	23
38	.85811	1.16535	.88888	1.12501	.92062	1.08622	.95340	1.04888	22
39	.85862	1.16466	.88940	1.12435	.92116	1.08559	.95395	1.04827	21
40	.85912	1.16398	.88992	1.12369	.92170	1.08496	.95451	1.04766	20
41	.85963	1.16329	.89045	1.12303	.92224	1.08432	.95506	1.04705	19
42	.86014	1.16261	.89097	1.12238	.92277	1.08369	.95562	1.04644	18
43	.86064	1.16192	.89149	1.12172	.92331	1.08306	.95618	1.04583	17
44	.86115	1.16124	.89201	1.12106	.92385	1.08243	.95673	1.04522	16
45	.86166	1.16056	.89253	1.12041	.92439	1.08179	.95729	1.04461	15
46	.86216	1.15987	.89306	1.11975	.92493	1.08116	.95785	1.04401	14
47	.86267	1.15919	.89358	1.11909	.92547	1.08053	.95841	1.04340	13
48	.86318	1.15851	.89410	1.11844	.92601	1.07990	.95897	1.04279	12
49	.86368	1.15783	.89463	1.11778	.92655	1.07927	.95952	1.04218	11
50	.86419	1.15715	.89515	1.11713	.92709	1.07864	.96008	1.04158	10
51	.86470	1.15647	.89567	1.11648	.92763	1.07801	.96064	1.04097	9
52	.86521	1.15579	.89620	1.11582	.92817	1.07738	.96120	1.04036	8
53	.86572	1.15511	.89672	1.11517	.92872	1.07676	.96176	1.03976	7
54	.86623	1.15443	.89725	1.11452	.92926	1.07613	.96232	1.03915	6
55	.86674	1.15375	.89777	1.11387	.92980	1.07550	.96288	1.03855	5
56	.86725	1.15308	.89830	1.11321	.93034	1.07487	.96344	1.03794	4
57	.86776	1.15240	.89883	1.11256	.93088	1.07425	.96400	1.03734	3
58	.86827	1.15172	.89935	1.11191	.93143	1.07362	.96457	1.03674	2
59	.86878	1.15104	.89988	1.11126	.93197	1.07299	.96513	1.03613	1
60	.86929	1.15037	.90040	1.11061	.93252	1.07237	.96569	1.03553	0
′	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	Cotang.	Tang.	′
	49°		48°		47°		46°		

TABLE 8.—NATURAL TANGENTS AND COTANGENTS.

′	44°		′	′	44°		′	′	44°		′
	Tang.	Cotang.			Tang.	Cotang.			Tang.	Cotang.	
0	.96569	1.03553	60	20	.97700	1.02355	40	40	.98843	1.01170	20
1	.96625	1.03493	59	21	.97756	1.02295	39	41	.98901	1.01112	19
2	.96681	1.03433	58	22	.97813	1.02236	38	42	.98958	1.01053	18
3	.96738	1.03372	57	23	.97870	1.02176	37	43	.99016	1.00994	17
4	.96794	1.03312	56	24	.97927	1.02117	36	44	.99073	1.00935	16
5	.96850	1.03252	55	25	.97984	1.02057	35	45	.99131	1.00876	15
6	.96907	1.03192	54	26	.98041	1.01998	34	46	.99189	1.00818	14
7	.96963	1.03132	53	27	.98098	1.01939	33	47	.99247	1.00759	13
8	.97020	1.03072	52	28	.98155	1.01879	32	48	.99304	1.00701	12
9	.97076	1.03012	51	29	.98213	1.01820	31	49	.99362	1.00642	11
10	.97133	1.02952	50	30	.98270	1.01761	30	50	.99420	1.00583	10
11	.97189	1.02892	49	31	.98327	1.01702	29	51	.99478	1.00525	9
12	.97246	1.02832	48	32	.98384	1.01642	28	52	.99536	1.00467	8
13	.97302	1.02772	47	33	.98441	1.01583	27	53	.99594	1.00408	7
14	.97359	1.02713	46	34	.98499	1.01524	26	54	.99652	1.00350	6
15	.97416	1.02653	45	35	.98556	1.01465	25	55	.99710	1.00291	5
16	.97472	1.02593	44	36	.98613	1.01406	24	56	.99768	1.00233	4
17	.97529	1.02533	43	37	.98671	1.01347	23	57	.99826	1.00175	3
18	.97586	1.02474	42	38	.98728	1.01288	22	58	.99884	1.00116	2
19	.97643	1.02414	41	39	.98786	1.01229	21	59	.99942	1.00058	1
20	.97700	1.02355	40	40	.98843	1.01170	20	60	1.00000	1.00000	0
′	Cotang.	Tang.	′	′	Cotang.	Tang.	′	′	Cotang.	Tang.	′
	45°				45°				45°		

″	′	Sine.	S.	T.	Tang.	Cotang.	C.	D. 1″.	Cosine.	′
			4.685				15.314			
0	0	Inf. neg.	575	575	Inf. neg.	Inf. pos.	425		ten	60
60	1	6.463726	575	575	6.463726	13.536274	425		ten	59
120	2	.764756	575	575	.764756	.235244	425		ten	58
180	3	6.940847	575	575	6.940847	13.059153	425		ten	57
240	4	7.065786	575	575	7.065786	12.934214	425		ten	56
300	5	.162696	575	575	.162696	.837304	425		ten	55
360	6	.241877	575	575	.241878	.758122	425	.02	9.999999	54
420	7	.308824	575	575	.308825	.691175	425	.00	.999999	53
480	8	.366816	574	576	.366817	.633183	424	.00	.999999	52
540	9	.417968	574	576	.417970	.582030	424	.00	.999999	51
600	10	.463726	574	576	.463727	.536273	424	.02	.999998	50
660	11	7.505118	574	576	7.505120	12.494880	424	.00	9.999998	49
720	12	.542906	574	577	.542909	.457091	423	.02	.999997	48
780	13	.577668	574	577	.577672	.422328	423	.00	.999997	47
840	14	.609853	574	577	.609857	.390143	423	.02	.999996	46
900	15	.639816	573	578	.639820	.360180	422	.00	.999996	45
960	16	.667845	573	578	.667849	.332151	422	.02	.999995	44
1020	17	.694173	573	578	.694179	.305821	422	.00	.999995	43
1080	18	.718997	573	579	.719003	.280997	421	.02	.999994	42
1140	19	.742478	573	579	.742484	.257516	421	.02	.999993	41
1200	20	.764754	572	580	.764761	.235239	420	.00	.999993	40
1260	21	7.785943	572	580	7.785951	12.214049	420	.02	9.999992	39
1320	22	.806146	572	581	.806155	.193845	419	.02	.999991	38
1380	23	.825451	572	581	.825460	.174540	419	.02	.999990	37
1440	24	.843934	571	582	.843944	.156056	418	.02	.999989	36
1500	25	.861662	571	583	.861674	.138326	417	.00	.999989	35
1560	26	.878695	571	583	.878708	.121292	417	.02	.999988	34
1620	27	.895085	570	584	.895099	.104901	416	.02	.999987	33
1680	28	.910879	570	584	.910894	.089106	416	.02	.999986	32
1740	29	.926119	570	585	.926134	.073866	415	.02	.999985	31
1800	30	.940842	569	586	.940858	.059142	414	.03	.999983	30
1860	31	7.955082	569	587	7.955100	12.044900	413	.02	9.999982	29
1920	32	.968870	569	587	.968889	.031111	413	.02	.999981	28
1980	33	.982233	568	588	.982253	.017747	412	.02	.999980	27
2040	34	7.995198	568	589	7.995219	12.004781	411	.03	.999979	26
2100	35	8.007787	567	590	8.007809	11.992191	410	.02	.999977	25
2160	36	.020021	567	591	.020044	.979956	409	.02	.999976	24
2220	37	.031919	566	592	.031945	.968055	408	.03	.999975	23
2280	38	.043501	566	593	.043527	.956473	407	.02	.999973	22
2340	39	.054781	566	593	.054809	.945191	407	.02	.999972	21
2400	40	.065776	565	594	.065806	.934194	406	.02	.999971	20
2460	41	8.076500	565	595	8.076531	11.923469	405	.03	9.999969	19
2520	42	.086965	564	596	.086997	.913003	404	.02	.999968	18
2580	43	.097183	564	598	.097217	.902783	402	.03	.999966	17
2640	44	.107167	563	599	.107203	.892797	401	.03	.999964	16
2700	45	.116926	562	600	.116963	.883037	400	.02	.999963	15
2760	46	.126471	562	601	.126510	.873490	399	.03	.999961	14
2820	47	.135810	561	602	.135851	.864149	398	.03	.999959	13
2880	48	.144953	561	603	.144996	.855004	397	.02	.999958	12
2940	49	.153907	560	604	.153952	.846048	396	.03	.999956	11
3000	50	.162681	560	605	.162727	.837273	395	.03	.999954	10
3060	51	8.171280	559	607	8.171328	11.828672	393	.03	9.999952	9
3120	52	.179713	558	608	.179763	.820237	392	.03	.999950	8
3180	53	.187985	558	609	.188036	.811964	391	.03	.999948	7
3240	54	.196102	557	611	.196156	.803844	389	.03	.999946	6
3300	55	.204070	556	612	.204126	.795874	388	.03	.999944	5
3360	56	.211895	556	613	.211953	.788047	387	.03	.999942	4
3420	57	.219581	555	615	.219641	.780359	385	.03	.999940	3
3480	58	.227134	554	616	.227195	.772805	384	.03	.999938	2
3540	59	.234557	554	618	.234621	.765379	382	.03	.999936	1
3600	60	8.241855	553	619	8.241921	11.758079	381	.03	9.999934	0
			4.685				15.314			
″	′	Cosine.			Cotang.	Tang.		D. 1″.	Sine.	′

TABLE 9.—LOGARITHMIC SINES, COSINES,

″	′	Sine.	S.	T.	Tang.	Cotang.	C.	D. 1″.	Cosine.	′
			4.685				15.314			
3600	0	8.241855	553	619	8.241521	11.758079	381		9.999934	60
3660	1	.249033	552	620	.249102	.750898	380	.03	.999932	59
3720	2	.256094	551	622	.256165	.743835	378	.05	.999929	58
3780	3	.263042	551	623	.263115	.736885	377	.03	.999927	57
3840	4	.269881	550	625	.269956	.730044	375	.03	.999925	56
3900	5	.276614	549	627	.276691	.723309	373	.05	.999922	55
3960	6	.283243	548	628	.283323	.716677	372	.03	.999920	54
4020	7	.289773	547	630	.289856	.710144	370	.03	.999918	53
4080	8	.296207	546	632	.296292	.703708	368	.05	.999915	52
4140	9	.302546	546	633	.302634	.697366	367	.03	.999913	51
4200	10	.308794	545	635	.308884	.691116	365	.05	.999910	50
4260	11	8.314954	544	637	8.315046	11.684954	363	.05	9.999907	49
4320	12	.321027	543	638	.321122	.678878	362	.03	.999905	48
4380	13	.327016	542	640	.327114	.672886	360	.05	.999902	47
4440	14	.332924	541	642	.333025	.666975	358	.05	.999899	46
4500	15	.338753	540	644	.338856	.661144	356	.03	.999897	45
4560	16	.344504	539	646	.344610	.655390	354	.05	.999894	44
4620	17	.350181	539	648	.350289	.649711	352	.05	.999891	43
4680	18	.355783	538	649	.355895	.644105	351	.05	.999888	42
4740	19	.361315	537	651	.361430	.638570	349	.05	.999885	41
4800	20	.366777	536	653	.366895	.633105	347	.05	.999882	40
4860	21	8.372171	535	655	8.372292	11.627708	345	.05	9.999879	39
4920	22	.377499	534	657	.377622	.622378	343	.05	.999876	38
4980	23	.382762	533	659	.382889	.617111	341	.05	.999873	37
5040	24	.387962	532	661	.388092	.611908	339	.05	.999870	36
5100	25	.393101	531	663	.393234	.606766	337	.05	.999867	35
5160	26	.398179	530	666	.398315	.601685	334	.05	.999864	34
5220	27	.403199	529	668	.403338	.596662	332	.05	.999861	33
5280	28	.408161	527	670	.408304	.591696	330	.05	.999858	32
5340	29	.413068	526	672	.413213	.586787	328	.07	.999854	31
5400	30	.417919	525	674	.418068	.581932	326	.05	.999851	30
5460	31	8.422717	524	676	8.422869	11.577131	324	.05	9.999848	29
5520	32	.427462	523	679	.427618	.572382	321	.07	.999844	28
5580	33	.432156	522	681	.432315	.567685	319	.05	.999841	27
5640	34	.436800	521	683	.436962	.563038	317	.05	.999838	26
5700	35	.441394	520	685	.441560	.558440	315	.07	.999834	25
5760	36	.445941	518	688	.446110	.553890	312	.05	.999831	24
5820	37	.450440	517	690	.450613	.549387	310	.07	.999827	23
5880	38	.454893	516	693	.455070	.544930	307	.05	.999824	22
5940	39	.459301	515	695	.459481	.540519	305	.07	.999820	21
6000	40	.463665	514	697	.463849	.536151	303	.07	.999816	20
6060	41	8.467985	512	700	8.468172	11.531828	300	.05	9.999813	19
6120	42	.472263	511	702	.472454	.527546	298	.07	.999809	18
6180	43	.476498	510	705	.476693	.523307	295	.07	.999805	17
6240	44	.480693	509	707	.480892	.519108	293	.07	.999801	16
6300	45	.484848	507	710	.485050	.514950	290	.07	.999797	15
6360	46	.488963	506	713	.489170	.510830	287	.05	.999794	14
6420	47	.493040	505	715	.493250	.506750	285	.07	.999790	13
6480	48	.497078	503	718	.497293	.502707	282	.07	.999786	12
6540	49	.501080	502	720	.501298	.498702	280	.07	.999782	11
6600	50	.505045	501	723	.505267	.494733	277	.07	.999778	10
6660	51	8.508974	499	726	8.509200	11.490800	274	.07	9.999774	9
6720	52	.512867	498	729	.513098	.486902	271	.08	.999769	8
6780	53	.516726	497	731	.516961	.483039	269	.07	.999765	7
6840	54	.520551	495	734	.520790	.479210	266	.07	.999761	6
6900	55	.524343	494	737	.524586	.475414	263	.07	.999757	5
6960	56	.528102	492	740	.528349	.471651	260	.07	.999753	4
7020	57	.531828	491	743	.532080	.467920	257	.08	.999748	3
7080	58	.535523	490	745	.535779	.464221	255	.07	.999744	2
7140	59	.539186	488	748	.539447	.460553	252	.07	.999740	1
7200	60	8.542819	487	751	8.543084	11.456916	249	.08	9.999735	0
			4.685				15.314			
″	′	Cosine.			Cotang.	Tang.		D. 1″.	Sine.	′

2° 177°

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	8.542819	60.05	9.999735	.07	8.543084	60.12	11.456916	60
1	.546422	59.55	.999731	.08	.546691	59.62	.453309	59
2	.549995	59.07	.999726	.07	.550268	59.15	.449732	58
3	.553539	58.58	.999722	.08	.553817	58.65	.446183	57
4	.557054	58.10	.999717	.07	.557336	58.20	.442664	56
5	.560540	57.65	.999713	.08	.560828	57.72	.439172	55
6	.563999	57.20	.999708	.07	.564291	57.27	.435709	54
7	.567431	56.75	.999704	.08	.567727	56.83	.432273	53
8	.570836	56.30	.999699	.08	.571137	56.38	.428863	52
9	.574214	55.87	.999694	.08	.574520	55.95	.425480	51
10	.577566	55.43	.999689	.07	.577877	55.52	.422123	50
11	8.580892	55.02	9.999685	.08	8.581208	55.10	11.418792	49
12	.584193	54.60	.999680	.08	.584514	54.68	.415486	48
13	.587469	54.20	.999675	.08	.587795	54.27	.412205	47
14	.590721	53.78	.999670	.08	.591051	53.87	.408949	46
15	.593948	53.40	.999665	.08	.594283	53.48	.405717	45
16	.597152	53.00	.999660	.08	.597492	53.08	.402508	44
17	.600332	52.62	.999655	.08	.600677	52.70	.399323	43
18	.603489	52.23	.999650	.08	.603839	52.32	.396161	42
19	.606623	51.85	.999645	.08	.606978	51.93	.393022	41
20	.609734	51.48	.999640	.08	.610094	51.58	.389906	40
21	8.612823	51.13	9.999635	.10	8.613189	51.22	11.386811	39
22	.615891	50.77	.999629	.08	.616262	50.85	.383738	38
23	.618937	50.42	.999624	.08	.619313	50.50	.380687	37
24	.621962	50.05	.999619	.08	.622343	50.15	.377657	36
25	.624965	49.72	.999614	.10	.625352	49.80	.374648	35
26	.627948	49.38	.999608	.08	.628340	49.47	.371660	34
27	.630911	49.05	.999603	.10	.631308	49.13	.368692	33
28	.633854	48.70	.999597	.08	.634256	48.80	.365744	32
29	.636776	48.40	.999592	.10	.637184	48.48	.362816	31
30	.639680	48.05	.999586	.08	.640093	48.15	.359907	30
31	8.642563	47.75	9.999581	.10	8.642982	47.85	11.357018	29
32	.645428	47.43	.999575	.08	.645853	47.52	.354147	28
33	.648274	47.13	.999570	.10	.648704	47.22	.351296	27
34	.651102	46.82	.999564	.10	.651537	46.92	.348463	26
35	.653911	46.52	.999558	.08	.654352	46.62	.345648	25
36	.656702	46.22	.999553	.10	.657149	46.32	.342851	24
37	.659475	45.92	.999547	.10	.659928	46 02	.340072	23
38	.662230	45.63	.999541	.10	.662689	45.73	.337311	22
39	.664968	45.35	.999535	.10	.665433	45.45	.334567	21
40	.667689	45.07	.999529	.08	.668160	45.17	.331840	20
41	8.670393	44.78	9.999524	.10	8.670870	44.88	11.329130	19
42	.673080	44.52	.999518	.10	.673563	44.60	.326437	18
43	.675751	44.23	.999512	.10	.676239	44.35	.323761	17
44	.678405	43.97	.999506	.10	.678900	44.07	.321100	16
45	.681043	43.70	.999500	.12	.681544	43.80	.318456	15
46	.683665	43.45	.999493	.10	.684172	43.53	.315828	14
47	.686272	43.18	.999487	.10	.686784	43.28	.313216	13
48	.688863	42.92	.999481	.10	.689381	43.03	.310619	12
49	.691438	42.67	.999475	.10	.691963	42.77	.308037	11
50	.693998	42.42	.999469	.10	.694529	42.53	.305471	10
51	8.696543	42.17	9.999463	.12	8.697081	42.27	11.302919	9
52	.699073	41.93	.999456	.10	.699617	42.03	.300383	8
53	.701589	41.68	.999450	.12	.702139	41.78	.297861	7
54	.704090	41.45	.999443	.10	.704646	41.57	.295354	6
55	.706577	41.20	.999437	.10	.707140	41.30	.292860	5
56	.709049	40.97	.999431	12	.709618	41.08	.290382	4
57	.711507	40.75	.999424	.10	.712083	40.85	.287917	3
58	713952	40.52	.999418	.12	.714534	40.63	.285466	2
59	.716383	40.28	.999411	.12	.716972	40.40	.283028	1
60	8.718800		9.999404		8.719396		11.280604	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

92° 87°

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	8.718800	40.07	9.999404	.10	8.719396	40.17	11.280604	60
1	.721204	39.85	.999398	.12	.721806	39.97	.278194	59
2	.723595	39.62	.999391	.12	.724204	39.73	.275796	58
3	.725972	39.42	.999384	.10	.726588	39.52	.273412	57
4	.728337	39.18	.999378	.12	.728959	39.30	.271041	56
5	.730688	38.98	.999371	.12	.731317	39.10	.268683	55
6	.733027	38.78	.999364	.12	.733663	38.88	.266337	54
7	.735354	38.55	.999357	.12	.735996	38.68	.264004	53
8	.737667	38.37	.999350	.12	.738317	38.48	.261683	52
9	.739969	38.17	.999343	.12	.740626	38.27	.259374	51
10	.742259	37.95	.999336	.12	.742922	38.08	.257078	50
11	8.744536	37.77	9.999329	.12	8.745207	37.87	11.254793	49
12	.746802	37.55	.999322	.12	.747479	37.68	.252521	48
13	.749055	37.37	.999315	.12	.749740	37.48	.250260	47
14	.751297	37.18	.999308	.12	.751989	37.30	.248011	46
15	.753528	36.98	.999301	.12	.754227	37.10	.245773	45
16	.755747	36.80	.999294	.12	.756453	36.92	.243547	44
17	.757955	36.60	.999287	.13	.758668	36.73	.241332	43
18	.760151	36.43	.999279	.12	.760872	36.55	.239128	42
19	.762337	36.23	.999272	.12	.763065	36.35	.236935	41
20	.764511	36.07	.999265	.13	.765246	36.18	.234754	40
21	8.766675	35.88	9.999257	.12	8.767417	36.02	11.232583	39
22	.768828	35.70	.999250	.13	.769578	35.82	.230422	38
23	.770970	35.52	.999242	.12	.771727	35.65	.228273	37
24	.773101	35.37	.999235	.13	.773866	35.48	.226134	36
25	.775223	35.17	.999227	.12	.775995	35.32	.224005	35
26	.777333	35.02	.999220	.13	.778114	35.13	.221886	34
27	.779434	34.83	.999212	.12	.780222	34.97	.219778	33
28	.781524	34.68	.999205	.13	.782320	34.80	.217680	32
29	.783605	34.50	.999197	.13	.784408	34.63	.215592	31
30	.785675	34.35	.999189	.13	.786486	34.47	.213514	30
31	8.787736	34.18	9.999181	.12	8.788554	34.32	11.211446	29
32	.789787	34.02	.999174	.13	.790613	34.15	.209387	28
33	.791828	33.85	.999166	.13	.792662	33.98	.207338	27
34	.793859	33.70	.999158	.13	.794701	33.83	.205299	26
35	.795881	33.55	.999150	.13	.796731	33.68	.203269	25
36	.797894	33.38	.999142	.13	.798752	33.52	.201248	24
37	.799897	33.25	.999134	.13	.800763	33.37	.199237	23
38	.801892	33.07	.999126	.13	.802765	33.22	.197235	22
39	.803876	32.93	.999118	.13	.804758	33.07	.195242	21
40	.805852	32.78	.999110	.13	.806742	32.92	.193258	20
41	8.807819	32.63	9.999102	.13	8.808717	32.77	11.191283	19
42	.809777	32.48	.999094	.13	.810683	32.63	.189317	18
43	.811726	32.35	.999086	.15	.812641	32.47	.187359	17
44	.813667	32.20	.999077	.13	.814589	32.33	.185411	16
45	.815599	32.05	.999069	.13	.816529	32.20	.183471	15
46	.817522	31.90	.999061	.13	.818461	32.05	.181539	14
47	.819436	31.78	.999053	.13	.820384	31.90	.179616	13
48	.821343	31.62	.999044	.15	.822298	31.78	.177702	12
49	.823240	31.50	.999036	.13	.824205	31.63	.175795	11
50	.825130	31.35	.999027	.15	.826103	31.48	.173897	10
51	8.827011	31.22	9.999019	.13	8.827992	31.37	11.172008	9
52	.828884	31.08	.999010	.15	.829874	31.23	.170126	8
53	.830749	30.97	.999002	.13	.831748	31.08	.168252	7
54	.832607	30.82	.998993	.15	.833613	30.97	.166387	6
55	.834456	30.68	.998984	.15	.835471	30.83	.164529	5
56	.836297	30.55	.998976	.13	.837321	30.70	.162679	4
57	.838130	30.43	.998967	.15	.839163	30.58	.160837	3
58	.839956	30.30	.998958	.15	.840998	30.45	.159002	2
59	.841774	30.18	.998950	.13	.842825	30.32	.157175	1
60	8.843585		9.998941	.15	8.844644		11.155356	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

93° 86°

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	8. 843585	30. 03	9. 998941	.15	8. 844644	30. 18	11. 155356	60
1	. 845387	29. 93	. 998932	.15	. 846455	30. 08	. 153545	59
2	. 847183	29. 80	. 998923	.15	. 848260	29. 95	. 151740	58
3	. 848971	29. 67	. 998914	.15	. 850057	29. 82	. 149943	57
4	. 850751	29. 57	. 998905	.15	. 851846	29. 70	. 148154	56
5	. 852525	29. 43	. 998896	.15	. 853628	29. 58	. 146372	55
6	. 854291	29. 30	. 998887	.15	. 855403	29. 47	. 144597	54
7	. 856049	29. 20	. 998878	.15	. 857171	29. 35	. 142829	53
8	. 857801	29. 08	. 998869	.15	. 858932	29. 23	. 141068	52
9	. 859546	28. 95	. 998860	.15	. 860686	29. 12	. 139314	51
10	. 861283	28. 85	. 998851	.17	. 862433	29. 00	. 137567	50
11	8. 863014	28. 73	9. 998841	.15	8. 864173	28. 88	11. 135827	49
12	. 864738	28. 62	. 998832	.15	. 865906	28. 77	. 134094	48
13	. 866455	28. 50	. 998823	.17	. 867632	28. 65	. 132368	47
14	. 868165	28. 38	. 998813	.15	. 869351	28. 55	. 130649	46
15	. 869868	28. 28	. 998804	.15	. 871064	28. 43	. 128936	45
16	. 871565	28. 17	. 998795	.17	. 872770	28. 32	. 127230	44
17	. 873255	28. 05	. 998785	.15	. 874469	28. 22	. 125531	43
18	. 874938	27. 95	. 998776	.17	. 876162	28. 12	. 123838	42
19	. 876615	27. 83	. 998766	.15	. 877849	28. 00	. 122151	41
20	. 878285	27. 73	. 998757	.17	. 879529	27. 88	. 120471	40
21	8. 879949	27. 63	9. 998747	.15	8. 881202	27. 78	11. 118798	39
22	. 881607	27. 52	. 998738	.17	. 882869	27. 68	. 117131	38
23	. 883258	27. 42	. 998728	.17	. 884530	27. 58	. 115470	37
24	. 884903	27. 32	. 998718	.17	. 886185	27. 47	. 113815	36
25	. 886542	27. 20	. 998708	.15	. 887833	27. 38	. 112167	35
26	. 888174	27. 12	. 998699	.17	. 889476	27. 27	. 110524	34
27	. 889801	27. 00	. 998689	.17	. 891112	27. 17	. 108888	33
28	. 891421	26. 90	. 998679	.17	. 892742	27. 07	. 107258	32
29	. 893035	26. 80	. 998669	.17	. 894366	26. 97	. 105634	31
30	. 894643	26. 72	. 998659	.17	. 895984	26. 87	. 104016	30
31	8. 896246	26. 60	9. 998649	.17	8. 897596	26. 78	11. 102404	29
32	. 897842	26. 50	. 998639	.17	. 899203	26. 67	. 100797	28
33	. 899432	26. 42	. 998629	.17	. 900803	26. 58	. 099197	27
34	. 901017	26. 32	. 998619	.17	. 902398	26. 48	. 097602	26
35	. 902596	26. 22	. 998609	.17	. 903987	26. 38	. 096013	25
36	. 904169	26. 12	. 998599	.17	. 905570	26. 28	. 094430	24
37	. 905736	26. 02	. 998589	.18	. 907147	26. 20	. 092853	23
38	. 907297	25. 93	. 998578	.17	. 908719	26. 10	. 091281	22
39	. 908853	25. 85	. 998568	.17	. 910285	26. 02	. 089715	21
40	. 910404	25. 75	. 998558	.17	. 911846	25. 92	. 088154	20
41	8. 911949	25. 65	9. 998548	.18	8. 913401	25. 83	11. 086599	19
42	. 913488	25. 57	. 998537	.17	. 914951	25. 73	. 085049	18
43	. 915022	25. 47	. 998527	.18	. 916495	25. 63	. 083505	17
44	. 916550	25. 38	. 998516	.17	. 918034	25. 57	. 081966	16
45	. 918073	25. 30	. 998506	.18	. 919568	25. 47	. 080432	15
46	. 919591	25. 20	. 998495	.17	. 921096	25. 38	. 078904	14
47	. 921103	25. 12	. 998485	.18	. 922619	25. 28	. 077381	13
48	. 922610	25. 03	. 998474	.17	. 924136	25. 22	. 075864	12
49	. 924112	24. 95	. 998464	.18	. 925649	25. 12	. 074351	11
50	. 925609	24. 85	. 998453	.18	. 927156	25. 03	. 072844	10
51	8. 927100	24. 78	9. 998442	.18	8. 928658	24. 95	11. 071342	9
52	. 928587	24. 68	. 998431	.17	. 930155	24. 87	. 069845	8
53	. 930068	24. 60	. 998421	.18	. 931647	24. 78	. 068353	7
54	. 931544	24. 52	. 998410	.18	. 933134	24. 70	. 066866	6
55	. 933015	24. 43	. 998399	.18	. 934616	24. 62	. 065384	5
56	. 934481	24. 35	. 998388	.18	. 936093	24. 53	. 063907	4
57	. 935942	24. 27	. 998377	.18	. 937565	24. 45	. 062435	3
58	. 937398	24. 20	. 998366	.18	. 939032	24. 37	. 060968	2
59	. 938850	24. 10	. 998355	.18	. 940494	24. 30	. 059506	1
60	8. 940296		9. 998344		8. 941952		11. 058048	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D.1″.	Cosine.	D.1″	Tang.	D.1″.	Cotang.	′
0	8.940296		9.998344		8.941952		11.058048	60
1	.941738	24.03	.998333	.18	.943404	24.20	.056596	59
2	.943174	23.93	.998322	.18	.944852	24.13	.055148	58
3	.944606	23.87	.998311	.18	.946295	24.05	.053705	57
4	.946034	23.80	.998300	.18	.947734	23.98	.052266	56
5	.947456	23.70	.998289	.18	.949168	23.90	.050832	55
6	.948874	23.63	.998277	.20	.950597	23.82	.049403	54
7	.950287	23.55	.998266	.18	.952021	23.73	.047979	53
8	.951696	23.48	.998255	.18	.953441	23.67	.046559	52
9	.953100	23.40	.998243	.20	.954856	23.58	.045144	51
10	.954499	23.32	.998232	.18	.956267	23.52	.043733	50
		23.25		.20		23.45		
11	8.955894		9.998220	.18	8.957674		11.042326	49
12	.957284	23.17	.998209	.20	.959075	23.35	.040925	48
13	.958670	23.10	.998197	.18	.960473	23.30	.039527	47
14	.960052	23.03	.998186	.20	.961866	23.22	.038134	46
15	.961429	22.95	.998174	.18	.963255	23.15	.036745	45
16	.962801	22.87	.998163	.20	.964639	23.07	.035361	44
17	.964170	22.82	.998151	.20	.966019	23.00	.033981	43
18	.965534	22.73	.998139	.20	.967394	22.92	.032606	42
19	.966893	22.65	.998128	.18	.968766	22.87	.031234	41
20	.968249	22.60	.998116	.20	.970133	22.78	.029867	40
		22.52		.20		22.72		
21	8.969600		9.998104	.20	8.971496		11.028504	39
22	.970947	22.45	.998092	.20	.972855	22.65	.027145	38
23	.972289	22.37	.998080	.20	.974209	22.57	.025791	37
24	.973628	22.32	.998068	.20	.975560	22.52	.024440	36
25	.974962	22.23	.998056	.20	.976906	22.43	.023094	35
26	.976293	22.18	.998044	.20	.978248	22.37	.021752	34
27	.977619	22.10	.998032	.20	.979586	22.30	.020414	33
28	.978941	22.03	.998020	.20	.980921	22.25	.019079	32
29	.980259	21.97	.998008	.20	.982251	22.17	.017749	31
30	.981573	21.90	.997996	.20	.983577	22.10	.016423	30
		21.83				22.03		
31	8.982883		9.997984	.20	8.984899		11.015101	29
32	.984189	21.77	.997972	.22	.986217	21.97	.013783	28
33	.985491	21.72	.997959	.20	.987532	21.92	.012468	27
34	.986789	21.63	.997947	.20	.988842	21.83	.011158	26
35	.988083	21.57	.997935	.22	.990149	21.78	.009851	25
36	.989374	21.52	.997922	.20	.991451	21.70	.008549	24
37	.990660	21.43	.997910	.22	.992750	21.65	.007250	23
38	.991943	21.38	.997897	.20	.994045	21.58	.005955	22
39	.993222	21.32	.997885	.22	.995337	21.53	.004663	21
40	.994497	21.25	.997872	.20	.996624	21.45	.003376	20
		21.18				21.40		
41	8.995768		9.997860	.22	8.997908		11.002092	19
42	.997036	21.13	.997847	.20	8.999188	21.33	11.000812	18
43	.998299	21.05	.997835	.22	9.000465	21.28	10.999535	17
44	8.999560	21.02	.997822	.22	.001738	21.22	.998262	16
45	9.000816	20.93	.997809	.22	.003007	21.15	.996993	15
46	.002069	20.88	.997797	.20	.004272	21.08	.995728	14
47	.003318	20.82	.997784	.22	.005534	21.03	.994466	13
48	.004563	20.75	.997771	.22	.006792	20.97	.993208	12
49	.005805	20.70	.997758	.22	.008047	20.92	.991953	11
50	.007044	20.65	.997745	.22	.009298	20.85	.990702	10
		20.57				20.80		
51	9.008278		9.997732	.22	9.010546		10.989454	9
52	.009510	20.53	.997719	.22	.011790	20.73	.988210	8
53	.010737	20.45	.997706	.22	.013031	20.68	.986969	7
54	.011962	20.42	.997693	.22	.014268	20.62	.985732	6
55	.013182	20.33	.997680	.22	.015502	20.57	.984498	5
56	.014400	20.30	.997667	.22	.016732	20.50	.983268	4
57	.015613	20.22	.997654	.22	.017959	20.45	.982041	3
58	.016824	20.18	.997641	.22	.019183	20.40	.980817	2
59	.018031	20.12	.997628	.23	.020403	20.33	.979597	1
60	9.019235	20.07	9.997614		9.021620	20.28	10.978380	0
′	Cosine.	D.1″	Sine.	D.1″.	Cotang.	D.1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 019235	20. 00	9. 997614	.22	9. 021620	20. 23	10. 978380	60
1	.020435	19. 95	.997601	.22	.022834	20. 17	.977166	59
2	.021632	19. 88	.997588	.23	.024044	20. 12	.975956	58
3	.022825	19. 85	.997574	.22	.025251	20. 07	.974749	57
4	.024016	19. 78	.997561	.23	.026455	20. 00	.973545	56
5	.025203	19. 72	.997547	.22	.027655	19. 95	.972345	55
6	.026386	19. 68	.997534	.23	.028852	19. 90	.971148	54
7	.027567	19. 62	.997520	.22	.030046	19. 85	.969954	53
8	.028744	19. 57	.997507	.23	.031237	19. 80	.968763	52
9	.029918	19. 52	.997493	.22	.032425	19. 73	.967575	51
10	.031089	19. 47	.997480	.23	.033609	19. 70	.966391	50
11	9. 032257	19. 40	9. 997466	.23	9. 034791	19. 63	10. 965209	49
12	.033421	19. 35	.997452	.22	.035969	19. 58	.964031	48
13	.034582	19. 32	.997439	.23	.037144	19. 53	.962856	47
14	.035741	19. 25	.997425	.23	.038316	19. 48	.961684	46
15	.036896	19. 20	.997411	.23	.039485	19. 43	.960515	45
16	.038048	19. 15	.997397	.23	.040651	19. 37	.959349	44
17	.039197	19. 08	.997383	.23	.041813	19. 33	.958187	43
18	.040342	19. 05	.997369	.23	.042973	19. 28	.957027	42
19	.041485	19. 00	.997355	.23	.044130	19. 23	.955870	41
20	.042625	18. 95	.997341	.23	.045284	19. 17	.954716	40
21	9. 043762	18. 88	9. 997327	.23	9. 046434	19. 13	10. 953566	39
22	.044895	18. 85	.997313	.23	.047582	19. 08	.952418	38
23	.046026	18. 80	.997299	.23	.048727	19. 03	.951273	37
24	.047154	18. 75	.997285	.23	.049869	18. 98	.950131	36
25	.048279	18. 68	.997271	.23	.051008	18. 93	.948992	35
26	.049400	18. 65	.997257	.25	.052144	18. 88	.947856	34
27	.050519	18. 60	.997242	.23	.053277	18. 83	.946723	33
28	.051635	18. 57	.997228	.23	.054407	18. 80	.945593	32
29	.052749	18. 50	.997214	.25	.055535	18. 73	.944465	31
30	.053859	18. 45	.997199	.23	.056659	18. 70	.943341	30
31	9. 054966	18. 42	9. 997185	.25	9. 057781	18. 65	10. 942219	29
32	.056071	18. 35	.997170	.23	.058900	18. 60	.941100	28
33	.057172	18. 32	.997156	.25	.060016	18. 57	.939984	27
34	.058271	18. 27	.997141	.23	.061130	18. 50	.938870	26
35	.059367	18. 22	.997127	.25	.062240	18. 47	.937760	25
36	.060460	18. 18	.997112	.23	.063348	18. 42	.936652	24
37	.061551	18. 13	.997098	.25	.064453	18. 38	.935547	23
38	.062639	18. 08	.997083	.25	.065556	18. 32	.934444	22
39	.063724	18. 03	.997068	.25	.066655	18. 28	.933345	21
40	.064806	17. 98	.997053	.23	.067752	18. 25	.932248	20
41	9. 065885	17. 95	9. 997039	.25	9. 068846	18. 20	10. 931154	19
42	.066962	17. 90	.997024	.25	.069938	18. 15	.930062	18
43	.068036	17. 85	.997009	.25	.071027	18. 10	.928973	17
44	.069107	17. 82	.996994	.25	.072113	18. 07	.927887	16
45	.070176	17. 77	.996979	.25	.073197	18. 02	.926803	15
46	.071242	17. 73	.996964	.25	.074278	17. 97	.925722	14
47	.072306	17. 67	.996949	.25	.075356	17. 93	.924644	13
48	.073366	17. 63	.996934	.25	.076432	17. 88	.923568	12
49	.074424	17. 60	.996919	.25	.077505	17. 85	.922495	11
50	.075480	17. 55	.996904	.25	.078576	17. 80	.921424	10
51	9. 076533	17. 50	9. 996889	.25	9. 079644	17. 77	10. 920356	9
52	.077583	17. 47	.996874	.27	.080710	17. 72	.919290	8
53	.078631	17. 42	.996858	.25	.081773	17. 67	.918227	7
54	.079676	17. 38	.996843	.27	.082833	17. 63	.917167	6
55	.080719	17. 33	.996828	.27	.083891	17. 60	.916109	5
56	.081759	17. 30	.996812	.25	.084947	17. 55	.915053	4
57	.082797	17. 25	.996797	.25	.086000	17. 50	.914000	3
58	.083832	17. 20	.996782	.27	.087050	17. 47	.912950	2
59	.084864	17. 17	.996766	.25	.088098	17. 43	.911902	1
60	9. 085894		9. 996751		9. 089144		10. 910856	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 085894	17.13	9. 996751	.27	9. 089144	17.38	10. 910856	60
1	.086922	17.08	.996735	.25	.090187	17.35	.909813	59
2	.087947	17.05	.996720	.27	.091228	17.30	.908772	58
3	.088970	17.00	.996704	.27	092266	17.27	.907734	57
4	.089990	16.97	.996688	.25	.093302	17.23	.906698	56
5	.091008	16.93	.996673	.27	.094336	17.18	.905664	55
6	.092024	16.88	.996657	.27	.095367	17.13	.904633	54
7	.093037	16.83	.996641	.27	.096395	17.12	.903605	53
8	.094047	16.82	.996625	.25	.097422	17.07	.902578	52
9	.095056	16.77	.996610	.27	.098446	17.03	.901554	51
10	.096062	16.72	.996594	.27	.099468	16.98	.900532	50
11	9. 097065	16.68	9. 996578	.27	9. 100487	16.95	10. 899513	49
12	.098066	16.65	.996562	.27	.101504	16.92	.898496	48
13	.099065	16.62	.996546	.27	.102519	16.88	.897481	47
14	.100062	16.57	.996530	.27	.103532	16.83	.896468	46
15	.101056	16.53	.996514	.27	.104542	16.80	.895458	45
16	.102048	16.48	.996498	.27	.105550	16.77	.894450	44
17	.103037	16.47	.996482	.28	.106556	16.72	.893444	43
18	.104025	16.42	.996465	.27	.107559	16.68	.892441	42
19	.105010	16.37	.996449	.27	.108560	16.65	.891440	41
20	.105992	16.35	.996433	.27	.109559	16.62	.890441	40
21	9. 106973	16.30	9. 996417	.28	9. 110556	16.58	10. 889444	39
22	.107951	16.27	.996400	.27	.111551	16.53	.888449	38
23	.108927	16.23	.996384	.27	.112543	16.50	.887457	37
24	.109901	16.20	.996368	.28	.113533	16.47	.886467	36
25	.110873	16.15	.996351	.27	.114521	16.43	.885479	35
26	.111842	16.12	.996335	.28	.115507	16.40	.884493	34
27	.112809	16.08	.996318	.27	.116491	16.35	.883509	33
28	.113774	16.05	.996302	.28	.117472	16.33	.882528	32
29	.114737	16.02	.996285	.27	.118452	16.28	.881548	31
30	.115698	15.97	.996269	.28	.119429	16.25	.880571	30
31	9. 116656	15.95	9. 996252	.28	9. 120404	16.22	10. 879596	29
32	.117613	15.90	.996235	.27	.121377	16.18	.878623	28
33	.118567	15.87	.996219	.28	.122348	16.15	.877652	27
34	.119519	15.83	.996202	.28	.123317	16.12	.876683	26
35	.120469	15.80	.996185	.28	.124284	16 08	.875716	25
36	.121417	15.75	.996168	.28	.125249	16.03	.874751	24
37	.122362	15.73	.996151	.28	.126211	16.02	.873789	23
38	.123306	15.70	.996134	.28	.127172	15.97	.872828	22
39	.124248	15.65	.996117	.28	.128130	15.95	.871870	21
40	.125187	15.63	.996100	.28	.129087	15.90	.870913	20
41	9. 126125	15.58	9. 996083	.28	9. 130041	15.88	10. 869959	19
42	.127060	15.55	.996066	.28	.130994	15.83	.869006	18
43	.127993	15.53	.996049	.28	.131944	15.82	.868056	17
44	.128925	15.48	.996032	.28	.132893	15.77	.867107	16
45	.129854	15.45	.996015	.28	.133839	15.75	.866161	15
46	.130781	15.42	.995998	.30	.134784	15.70	.865216	14
47	.131706	15.40	.995980	.28	.135726	15.68	.864274	13
48	.132630	15.35	.995963	.28	.136667	15.63	.863333	12
49	.133551	15.32	.995946	.30	.137605	15.62	.862395	11
50	.134470	15.28	.995928	.28	.138542	15.57	.861458	10
51	9. 135387	15.27	9. 995911	.28	9. 139476	15.55	10. 860524	9
52	.136303	15.22	.995894	.30	.140409	15.52	.859591	8
53	.137216	15.20	.995876	.28	.141340	15.48	.858660	7
54	.138128	15.15	.995859	.30	.142269	15.45	.857731	6
55	.139037	15.12	.995841	.30	.143196	15.42	.856804	5
56	.139944	15.10	.995823	.28	.144121	15.38	.855879	4
57	.140850	15.07	.995806	.30	.145044	15.37	.854956	3
58	.141754	15.02	.995788	.30	.145966	15.32	.854034	2
59	.142655	15.00	.995771	.28	.146885	15.30	.853115	1
60	9. 143555		9. 995753	.30	9. 147803		10. 852197	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.143555	14.97	9.995753	.30	9.147803	15.25	10.852197	60
1	.144453	14.93	.995735	.30	.148718	15.23	.851282	59
2	.145349	14.90	.995717	.30	.149632	15.20	.850368	58
3	.146243	14.88	.995699	.30	.150544	15.17	.849456	57
4	.147136	14.83	.995681	.28	.151454	15.15	.848546	56
5	.148026	14.82	.995664	.30	.152363	15.10	.847637	55
6	.148915	14.78	.995646	.30	.153269	15.08	.846731	54
7	.149802	14.73	.995628	.30	.154174	15.05	.845826	53
8	.150686	14.72	.995610	.32	.155077	15.02	.844923	52
9	.151569	14.70	.995591	.30	.155978	14.98	.844022	51
10	.152451	14.65	.995573	.30	.156877	14.97	.843123	50
11	9.153330	14.63	9.995555	.30	9.157775	14.93	10.842225	49
12	.154208	14.58	.995537	.30	.158671	14.90	.841329	48
13	.155083	14.57	.995519	.30	.159565	14.87	.840435	47
14	.155957	14.55	.995501	.32	.160457	14.83	.839543	46
15	.156830	14.50	.995482	.30	.161347	14.82	.838653	45
16	.157700	14.48	.995464	.30	.162236	14.78	.837764	44
17	.158569	14.43	.995446	.32	.163123	14.75	.836877	43
18	.159435	14.43	.995427	.30	.164008	14.73	.835992	42
19	.160301	14.38	.995409	.32	.164892	14.70	.835108	41
20	.161164	14.35	.995390	.30	.165774	14.67	.834226	40
21	9.162025	14.33	9.995372	.32	9.166654	14.63	10.833346	39
22	.162885	14.30	.995353	.32	.167532	14.62	.832468	38
23	.163743	14.28	.995334	.30	.168409	14.58	.831591	37
24	.164600	14.23	.995316	.32	.169284	14.55	.830716	36
25	.165454	14.22	.995297	.32	.170157	14.53	.829843	35
26	.166307	14.20	.995278	.30	.171029	14.50	.828971	34
27	.167159	14.15	.995260	.32	.171899	14.47	.828101	33
28	.168008	14.13	.995241	.32	.172767	14.45	.827233	32
29	.168856	14.10	.995222	.32	.173634	14.42	.826366	31
30	.169702	14.08	.995203	.32	.174499	14.38	.825501	30
31	9.170547	14.03	9.995184	.32	9.175362	14.37	10.824638	29
32	.171389	14.02	.995165	.32	.176224	14.35	.823776	28
33	.172230	14.00	.995146	.32	.177084	14.30	.822916	27
34	.173070	13.97	.995127	.32	.177942	14.28	.822058	26
35	.173908	13.93	.995108	.32	.178799	14.27	.821201	25
36	.174744	13.90	.995089	.32	.179655	14.22	.820345	24
37	.175578	13.88	.995070	.32	.180508	14.20	.819492	23
38	.176411	13.85	.995051	.32	.181360	14.18	.818640	22
39	.177242	13.83	.995032	.32	.182211	14.13	.817789	21
40	.178072	13.80	.995013	.33	.183059	14.13	.816941	20
41	9.178900	13.77	9.994993	.32	9.183907	14.08	10.816093	19
42	.179726	13.75	.994974	.32	.184752	14.08	.815248	18
43	.180551	13.72	.994955	.33	.185597	14.03	.814403	17
44	.181374	13.70	.994935	.32	.186439	14.02	.813561	16
45	.182196	13.67	.994916	.33	.187280	14.00	.812720	15
46	.183016	13.63	.994896	.32	.188120	13.97	.811880	14
47	.183834	13.62	.994877	.33	.188958	13.93	.811042	13
48	.184651	13.58	.994857	.32	.189794	13.92	.810206	12
49	.185466	13.57	.994838	.33	.190629	13.88	.809371	11
50	.186280	13.53	.994818	.33	.191462	13.87	.808538	10
51	9.187092	13.52	9.994798	.32	9.192294	13.83	10.807706	9
52	.187903	13.48	.994779	.33	.193124	13.82	.806876	8
53	.188712	13.45	.994759	.33	.193953	13.78	.806047	7
54	.189519	13.43	.994739	.32	.194780	13.77	.805220	6
55	.190325	13.42	.994720	.33	.195606	13.73	.804394	5
56	.191130	13.38	.994700	.33	.196430	13.72	.803570	4
57	.191933	13.35	.994680	.33	.197253	13.68	.802747	3
58	.192734	13.33	.994660	.33	.198074	13.67	.801926	2
59	.193534	13.30	.994640	.33	.198894	13.65	.801106	1
60	9.194332		9.994620		9.199713		10.800287	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.194332	13.28	9.994620	.33	9.199713	13.60	10.800287	60
1	.195129	13.27	.994600	.33	.200529	13.60	.799471	59
2	.195925	13.23	.994580	.33	.201345	13.57	.798655	58
3	.196719	13.20	.994560	.33	.202159	13.53	.797841	57
4	.197511	13.18	.994540	.33	.202971	13.52	.797029	56
5	.198302	13.15	.994519	.35	.203782	13.50	.796218	55
6	.199091	13.13	.994499	.33	.204592	13.47	.795408	54
7	.199879	13.12	.994479	.33	.205400	13.45	.794600	53
8	.200666	13.08	.994459	.35	.206207	13.43	.793793	52
9	.201451	13.05	.994438	.33	.207013	13.40	.792987	51
10	.202234	13.05	.994418	.33	.207817	13.37	.792183	50
11	9.203017	13.00	9.994398	.35	9.208619	13.35	10.791381	49
12	.203797	13.00	.994377	.33	.209420	13.33	.790580	48
13	.204577	12.95	.994357	.35	.210220	13.30	.789780	47
14	.205354	12.95	.994336	.33	.211018	13.28	.788982	46
15	.206131	12.92	.994316	.35	.211815	13.27	.788185	45
16	.206906	12.88	.994295	.35	.212611	13.23	.787389	44
17	.207679	12.88	.994274	.33	.213405	13.22	.786595	43
18	.208452	12.83	.994254	.35	.214198	13.18	.785802	42
19	.209222	12.83	.994233	.35	.214989	13.18	.785011	41
20	.209992	12.80	.994212	.35	.215780	13.13	.784220	40
21	9.210760	12.77	9.994191	.33	9.216568	13.13	10.783432	39
22	.211526	12.75	.994171	.35	.217356	13.10	.782644	38
23	.212291	12.73	.994150	.35	.218142	13.07	.781858	37
24	.213055	12.72	.994129	.35	.218926	13.07	.781074	36
25	.213818	12.68	.994108	.35	.219710	13.03	.780290	35
26	.214579	12.65	.994087	.35	.220492	13.00	.779508	34
27	.215338	12.65	.994066	.35	.221272	13.00	.778728	33
28	.216097	12.62	.994045	.35	.222052	12.97	.777948	32
29	.216854	12.58	.994024	.35	.222830	12.95	.777170	31
30	.217609	12.57	.994003	.35	.223607	12.92	.776393	30
31	9.218363	12.55	9.993982	.37	9.224382	12.90	10.775618	29
32	.219116	12.53	.993960	.35	.225156	12.88	.774844	28
33	.219868	12.50	.993939	.35	.225929	12.85	.774071	27
34	.220618	12.48	.993918	.35	.226700	12.85	.773300	26
35	.221367	12.47	.993897	.37	.227471	12.80	.772529	25
36	.222115	12.43	.993875	.35	.228239	12.80	.771761	24
37	.222861	12.42	.993854	.37	.229007	12.77	.770993	23
38	.223606	12.38	.993832	.35	.229773	12.77	.770227	22
39	.224349	12.38	.993811	.37	.230539	12.72	.769461	21
40	.225092	12.35	.993789	.35	.231302	12.72	.768698	20
41	9.225833	12.33	9.993768	.37	9.232065	12.68	10.767935	19
42	.226573	12.30	.993746	.35	.232826	12.67	.767174	18
43	.227311	12.28	.993725	.37	.233586	12.65	.766414	17
44	.228048	12.27	.993703	.37	.234345	12.63	.765655	16
45	.228784	12.23	.993681	.35	.235103	12.60	.764897	15
46	.229518	12.23	.993660	.37	.235859	12.58	.764141	14
47	.230252	12.20	.993638	.37	.236614	12.57	.763386	13
48	.230984	12.18	.993616	.37	.237368	12.53	.762632	12
49	.231715	12.15	.993594	.37	.238120	12.53	.761880	11
50	.232444	12.13	.993572	.37	.238872	12.50	.761128	10
51	9.233172	12.12	9.993550	.37	9.239622	12.48	10.760378	9
52	.233899	12.10	.993528	.37	.240371	12.45	.759629	8
53	.234625	12.07	.993506	.37	.241118	12.45	.758882	7
54	.235349	12.07	.993484	.37	.241865	12.42	.758135	6
55	.236073	12.03	.993462	.37	.242610	12.40	.757390	5
56	.236795	12.00	.993440	.37	.243354	12.38	.756646	4
57	.237515	12.00	.993418	.37	.244097	12.37	.755903	3
58	.238235	11.97	.993396	.37	.244839	12.33	.755161	2
59	.238953	11.95	.993374	.38	.245579	12.33	.754421	1
60	9.239670		9.993351		9.246319		10.753681	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 239670		9. 993351	37	9. 246319	12. 30	10. 753681	60
1	.240386	11. 93	.993329	.37	.247057	12. 28	.752943	59
2	.241101	11. 92	.993307	.38	.247794	12. 27	.752206	58
3	.241814	11. 88	.993284	.37	.248530	12. 23	.751470	57
4	.242526	11. 87	.993262	.37	.249264	12. 23	.750736	56
5	.243237	11. 85	.993240	.38	.249998	12. 20	.750002	55
6	.243947	11. 83	.993217	.37	.250730	12. 18	.749270	54
7	.244656	11. 82	.993195	.38	.251461	12. 17	.748539	53
8	.245363	11. 78	.993172	.38	.252191	12. 15	.747809	52
9	.246069	11. 77	.993149	.37	.252920	12. 13	.747080	51
10	.246775	11. 72	.993127	.38	.253648	12. 10	.746352	50
11	9. 247478		9. 993104	.38	9. 254374	12. 10	10. 745626	49
12	.248181	11. 72	.993081	.37	.255100	12. 07	.744900	48
13	.248883	11. 70	.993059	.38	.255824	12. 05	.744176	47
14	.249583	11. 67	.993036	.38	.256547	12. 03	.743453	46
15	.250282	11. 65	.993013	.38	.257269	12. 02	.742731	45
16	.250980	11. 63	.992990	.38	.257990	12. 00	.742010	44
17	.251677	11. 62	.992967	.38	.258710	11. 98	.741290	43
18	.252373	11. 60	.992944	.38	.259429	11. 95	.740571	42
19	.253067	11. 57	.992921	.38	.260146	11. 95	.739854	41
20	.253761	11. 57	.992898	.38	.260863	11. 92	.739137	40
21	9. 254453	11. 53	9. 992875	.38	9. 261578	11. 90	10. 738422	39
22	.255144	11. 52	.992852	.38	.262292	11. 88	.737708	38
23	.255834	11. 50	.992829	.38	.263005	11. 87	.736995	37
24	.256523	11. 48	.992806	.38	.263717	11. 85	.736283	36
25	.257211	11. 47	.992783	.40	.264428	11. 83	.735572	35
26	.257898	11. 45	.992759	.38	.265138	11. 82	.734862	34
27	.258583	11. 42	.992736	.38	.265847	11. 80	.734153	33
28	.259268	11. 42	.992713	.38	.266555	11. 77	.733445	32
29	.259951	11. 38	.992690	.40	.267261	11. 77	.732739	31
30	.260633	11. 37	.992666	.38	.267967	11. 73	.732033	30
31	9. 261314	11. 35	9. 992643	.40	9. 268671	11. 73	10. 731329	29
32	.261994	11. 33	.992619	.38	.269375	11. 70	.730625	28
33	.262673	11. 32	.992596	.40	.270077	11. 70	.729923	27
34	.263351	11. 30	.992572	.38	.270779	11. 67	.729221	26
35	.264027	11. 27	.992549	.40	.271479	11. 65	.728521	25
36	.264703	11. 27	.992525	.40	.272178	11. 63	.727822	24
37	.265377	11. 23	.992501	.38	.272876	11. 62	.727124	23
38	.266051	11. 23	.992478	.40	.273573	11. 60	.726427	22
39	.266723	11. 20	.992454	.40	.274269	11. 58	.725731	21
40	.267395	11. 20	.992430	.40	.274964	11. 57	.725036	20
41	9 268065	11. 17	9. 992406	.40	9. 275658	11. 55	10. 724342	19
42	.268734	11. 15	.992382	.38	.276351	11. 53	.723649	18
43	.269402	11. 13	.992359	.40	.277043	11. 52	.722957	17
44	270069	11. 12	.992335	.40	.277734	11. 50	.722266	16
45	.270735	11. 10	.992311	.40	.278424	11. 48	.721576	15
46	.271400	11. 08	.992287	.40	.279113	11. 47	.720887	14
47	.272064	11. 07	.992263	.40	.279801	11. 45	.720199	13
48	.272726	11. 03	.992239	.42	.280488	11. 43	.719512	12
49	.273388	11. 03	.992214	.40	.281174	11. 40	.718826	11
50	.274049	11. 02	.992190	.40	.281858	11. 40	.718142	10
51	9. 274708	10. 98	9. 992166	.40	9. 282542	11. 38	10. 717458	9
52	.275367	10. 98	.992142	.40	.283225	11. 37	.716775	8
53	.276025	10. 97	.992118	.42	.283907	11. 35	.716093	7
54	.276681	10. 93	.992093	.40	.284588	11. 33	.715412	6
55	.277337	10. 93	.992069	.42	.285268	11. 32	.714732	5
56	.277991	10. 90	.992044	.40	.285947	11. 28	.714053	4
57	.278645	10. 90	.992020	.40	.286624	11. 28	.713376	3
58	.279297	10. 87	.991996	.42	.287301	11. 27	.712699	2
59	.279948	10. 85	.991971	40	.287977	11. 25	.712023	1
60	9. 280599	10. 85	9. 991947		9. 288652		10. 711348	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.280599	10.82	9.991947	.42	9.288652	11.23	10.711348	60
1	.281248	10.82	.991922	.42	.289326	11.22	.710674	59
2	.281897	10.78	.991897	.40	.289999	11.20	.710001	58
3	.282544	10.77	.991873	.42	.290671	11.18	.709329	57
4	.283190	10.77	.991848	.42	.291342	11.18	.708658	56
5	.283836	10.73	.991823	.40	.292013	11.15	.707987	55
6	.284480	10.73	.991799	.42	.292682	11.13	.707318	54
7	.285124	10.70	.991774	.42	.293350	11.12	.706650	53
8	.285766	10.70	.991749	.42	.294017	11.12	.705983	52
9	.286408	10.67	.991724	.42	.294684	11.08	.705316	51
10	.287048	10.67	.991699	.42	.295349	11.07	.704651	50
11	9.287688	10.63	9.991674	.42	9.296013	11.07	10.703987	49
12	.288326	10.63	.991649	.42	.296677	11.03	.703323	48
13	.288964	10.60	.991624	.42	.297339	11.03	.702661	47
14	.289600	10.60	.991599	.42	.298001	11.02	.701999	46
15	.290236	10.57	.991574	.42	.298662	11.00	.701338	45
16	.290870	10.57	.991549	.42	.299322	10.97	.700678	44
17	.291504	10.55	.991524	.43	.299980	10.97	.700020	43
18	.292137	10.52	.991498	.42	.300638	10.95	.699362	42
19	.292768	10.52	.991473	.42	.301295	10.93	.698705	41
20	.293399	10.50	.991448	.43	.301951	10.93	.698049	40
21	9.294029	10.48	9.991422	.42	9.302607	10.90	10.697393	39
22	.294658	10.47	.991397	.42	.303261	10.88	.696739	38
23	.295286	10.45	.991372	.43	.303914	10.88	.696086	37
24	.295913	10.43	.991346	.42	.304567	10.85	.695433	36
25	.296539	10.42	.991321	.43	.305218	10.85	.694782	35
26	.297164	10.40	.991295	.42	.305869	10.83	.694131	34
27	.297788	10.40	.991270	.43	.306519	10.82	.693481	33
28	.298412	10.37	.991244	.43	.307168	10.80	.692832	32
29	.299034	10.35	.991218	.42	.307816	10.78	.692184	31
30	.299655	10.35	.991193	.43	.308463	10.77	.691537	30
31	9.300276	10.32	9.991167	.43	9.309109	10.75	10.690891	29
32	.300895	10.32	.991141	.43	.309754	10.75	.690246	28
33	.301514	10.30	.991115	.42	.310399	10.72	.689601	27
34	.302132	10.27	.991090	.43	.311042	10.72	.688958	26
35	.302748	10.27	.991064	.43	.311685	10.70	.688315	25
36	.303364	10.25	.991038	.43	.312327	10.68	.687673	24
37	.303979	10.23	.991012	.43	.312968	10.67	.687032	23
38	.304593	10.23	.990986	.43	.313608	10.65	.686392	22
39	.305207	10.20	.990960	.43	.314247	10.63	.685753	21
40	.305819	10.18	.990934	.43	.314885	10.63	.685115	20
41	9.306430	10.18	9.990908	.43	9.315523	10.60	10.684477	19
42	.307041	10.15	.990882	.45	.316159	10.60	.683841	18
43	.307650	10.15	.990855	.43	.316795	10.58	.683205	17
44	.308259	10.13	.990829	.43	.317430	10.57	.682570	16
45	.308867	10.12	.990803	.43	.318064	10.55	.681936	15
46	.309474	10.10	.990777	.45	.318697	10.55	.681303	14
47	.310080	10.08	.990750	.43	.319330	10.52	.680670	13
48	.310685	10.07	.990724	.45	.319961	10.52	.680039	12
49	.311289	10.07	.990697	.43	.320592	10.50	.679408	11
50	.311893	10.03	.990671	.43	.321222	10.48	.678778	10
51	9.312495	10.03	9.990645	.45	9.321851	10.47	10.678149	9
52	.313097	10.02	.990618	.45	.322479	10.45	.677521	8
53	.313698	9.98	.990591	.43	.323106	10.45	.676894	7
54	.314297	10.00	.990565	.45	.323733	10.42	.676267	6
55	.314897	9.97	.990538	.45	.324358	10.42	.675642	5
56	.315495	9.95	.990511	.43	.324983	10.40	.675017	4
57	.316092	9.95	.990485	.45	.325607	10.40	.674393	3
58	.316689	9.92	.990458	.45	.326231	10.37	.673769	2
59	.317284	9.92	.990431	.45	.326853	10.37	.673147	1
60	9.317879		9.990404		9.327475		10.672525	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 317879	9. 90	9. 990404	.43	9. 327475	10. 33	10. 672525	60
1	.318473	9. 88	.990378	.45	.328095	10. 33	.671905	59
2	.319066	9. 87	.990351	.45	.328715	10. 32	.671285	58
3	.319658	9. 85	.990324	.45	.329334	10. 32	.670666	57
4	.320249	9. 85	.990297	.45	.329953	10. 28	.670047	56
5	.320840	9. 83	.990270	.45	.330570	10. 28	.669430	55
6	.321430	9. 82	.990243	.47	.331187	10. 27	.668813	54
7	.322019	9. 80	.990215	.45	.331803	10. 25	.668197	53
8	.322607	9. 78	.990188	.45	.332418	10. 25	.667582	52
9	.323194	9. 77	.990161	.45	.333033	10. 22	.666967	51
10	.323780	9. 77	.990134	.45	.333646	10. 22	.666354	50
11	9. 324366	9. 73	9. 990107	.47	9. 334259	10. 20	10. 665741	49
12	.324950	9. 73	.990079	.45	.334871	10. 18	.665129	48
13	.325534	9. 72	.990052	.45	.335482	10. 18	.664518	47
14	.326117	9. 72	.990025	.47	.336093	10. 15	.663907	46
15	.326700	9. 68	.989997	.45	.336702	10. 15	.663298	45
16	.327281	9. 68	.989970	.47	.337311	10. 13	.662689	44
17	.327862	9. 67	.989942	.45	.337919	10. 13	.662081	43
18	.328442	9. 65	.989915	.47	.338527	10. 10	.661473	42
19	.329021	9. 63	.989887	.45	.339133	10. 10	.660867	41
20	.329599	9. 62	.989860	.47	.339739	10. 08	.660261	40
21	9. 330176	9. 62	9. 989832	.47	9. 340344	10. 07	10. 659656	39
22	.330753	9. 60	.989804	.45	.340948	10. 07	.659052	38
23	.331329	9. 57	.989777	.47	.341552	10. 05	.658448	37
24	.331903	9. 58	.989749	.47	.342155	10. 03	.657845	36
25	.332478	9. 55	.989721	.47	.342757	10. 02	.657243	35
26	.333051	9. 55	.989693	.47	.343358	10. 00	.656642	34
27	.333624	9. 52	.989665	.47	.343958	10. 00	.656042	33
28	.334195	9. 53	.989637	.45	.344558	9. 98	.655442	32
29	.334767	9. 50	.989610	.47	.345157	9. 97	.654843	31
30	.335337	9. 48	.989582	.48	.345755	9. 97	.654245	30
31	9. 335906	9. 48	9. 989553	.47	9. 346353	9. 93	10. 653647	29
32	.336475	9. 47	.989525	.47	.346949	9. 93	.653051	28
33	.337043	9. 45	.989497	.47	.347545	9. 93	.652455	27
34	.337610	9. 43	.989469	.47	.348141	9. 90	.651859	26
35	.338176	9. 43	.989441	.47	.348735	9. 90	.651265	25
36	.338742	9. 42	.989413	.47	.349329	9. 88	.650671	24
37	.339307	9. 40	.989385	.48	.349922	9. 87	.650078	23
38	.339871	9. 38	.989356	.47	.350514	9. 87	.649486	22
39	.340434	9. 37	.989328	.47	.351106	9. 85	.648894	21
40	.340996	9. 37	.989300	.48	.351697	9. 83	.648303	20
41	9. 341558	9. 35	9. 989271	.47	9. 352287	9. 82	10. 647713	19
42	.342119	9. 33	.989243	.48	.352876	9. 82	.647124	18
43	.342679	9. 33	.989214	.47	.353465	9. 80	.646535	17
44	.343239	9. 30	.989186	.48	.354053	9. 78	.645947	16
45	.343797	9. 30	.989157	.48	.354640	9. 78	.645360	15
46	.344355	9. 28	.989128	.47	.355227	9. 77	.644773	14
47	.344912	9. 28	.989100	.48	.355813	9. 75	.644187	13
48	.345469	9. 25	.989071	.48	.356398	9. 73	.643602	12
49	.346024	9. 25	.989042	.47	.356982	9. 73	.643018	11
50	.346579	9. 25	.989014	.48	.357566	9. 72	.642434	10
51	9. 347134	9. 22	9. 988985	.48	9. 358149	9. 70	10. 641851	9
52	.347687	9. 22	.988956	.48	.358731	9. 70	.641269	8
53	.348240	9. 20	.988927	.48	.359313	9. 67	.640687	7
54	.348792	9. 18	.988898	.48	.359893	9. 68	.640107	6
55	.349343	9. 17	.988869	.48	.360474	9. 65	.639526	5
56	.349893	9. 17	.988840	.48	.361053	9. 65	.638947	4
57	.350443	9. 15	.988811	.48	.361632	9. 63	.638368	3
58	.350992	9. 13	.988782	.48	.362210	9. 62	.637790	2
59	.351540	9. 13	.988753	.48	.362787	9. 62	.637213	1
60	9. 352088		9. 988724		9. 363364		10. 636636	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 352088		9. 988724		9. 363364		10. 636636	60
1	.352635	9.12	.988695	.48	.363940	9.60	.636060	59
2	.353181	9.10	.988666	.48	.364515	9.58	.635485	58
3	.353726	9.08	.988636	.50	.365090	9.58	.634910	57
4	.354271	9.08	.988607	.48	.365664	9.57	.634336	56
5	.354815	9.07	.988578	.48	.366237	9.55	.633763	55
6	.355358	9.05	.988548	.50	.366810	9.55	.633190	54
7	.355901	9.05	.988519	.48	.367382	9.53	.632618	53
8	.356443	9.03	.988489	.50	.367953	9.52	.632047	52
9	.356984	9.02	.988460	.48	.368524	9.52	.631476	51
10	.357524	9.00	.988430	.50	.369094	9.50	.630906	50
11	9. 358064	9.00	9. 988401	.48	9. 369663	9.48	10. 630337	49
12	.358603	8.98	.988371	.50	.370232	9.48	.629768	48
13	.359141	8.97	.988342	.48	.370799	9.45	.629201	47
14	.359678	8.95	.988312	.50	.371367	9.47	.628633	46
15	.360215	8.95	.988282	.50	.371933	9.43	.628067	45
16	.360752	8.95	.988252	.50	.372499	9.43	.627501	44
17	.361287	8.92	.988223	.48	.373064	9.42	.626936	43
18	.361822	8.92	.988193	.50	.373629	9.42	.626371	42
19	.362356	8.90	.988163	.50	.374193	9.40	.625807	41
20	.362889	8.88	.988133	.50	.374756	9.38	.625244	40
21	9. 363422	8.88	9. 988103	.50	9. 375319	9.38	10. 624681	39
22	.363954	8.87	.988073	.50	.375881	9.37	.624119	38
23	.364485	8.85	.988043	.50	.376442	9.35	.623558	37
24	.365016	8.85	.988013	.50	.377003	9.35	.622997	36
25	.365546	8.83	.987983	.50	.377563	9.33	.622437	35
26	.366075	8.82	.987953	.52	.378122	9.32	.621878	34
27	.366604	8.82	.987922	.50	.378681	9.32	.621319	33
28	.367131	8.78	.987892	.50	.379239	9.30	.620761	32
29	.367659	8.80	.987862	.50	.379797	9.30	.620203	31
30	.368185	8.77	.987832	.52	.380354	9.28	.619646	30
31	9. 368711	8.77	9. 987801	.50	9. 380910	9.27	10. 619090	29
32	.369236	8.75	.987771	.52	.381466	9.27	.618534	28
33	.369761	8.75	.987740	.50	.382020	9.23	.617980	27
34	.370285	8.72	.987710	.52	.382575	9.25	.617425	26
35	.370808	8.72	.987679	.50	.383129	9.23	.616871	25
36	.371330	8.70	.987649	.52	.383682	9.22	.616318	24
37	.371852	8.70	.987618	.50	.384234	9.20	.615766	23
38	.372373	8.68	.987588	.52	.384786	9.20	.615214	22
39	.372894	8.68	.987557	.52	.385337	9.18	.614663	21
40	.373414	8.67	.987526	.50	.385888	9.18	.614112	20
41	9. 373933	8.65	9. 987496	.52	9. 386438	9.17	10. 613562	19
42	.374452	8.65	.987465	.52	.386987	9.15	.613013	18
43	.374970	8.63	.987434	.52	.387536	9.15	.612464	17
44	.375487	8.62	.987403	.52	.388084	9.13	.611916	16
45	.376003	8.60	.987372	.52	.388631	9.12	.611369	15
46	.376519	8.60	.987341	.52	.389178	9.12	.610822	14
47	.377035	8.60	.987310	.52	.389724	9.10	.610276	13
48	.377549	8.57	.987279	.52	.390270	9.10	.609730	12
49	.378063	8.57	.987248	.52	.390815	9.08	.609185	11
50	.378577	8.57	.987217	.52	.391360	9.08	.608640	10
51	9. 379089	8.53	9. 987186	.52	9. 391903	9.05	10. 608097	9
52	.379601	8.53	.987155	.52	.392447	9.07	.607553	8
53	.380113	8.52	.987124	.53	.392989	9.03	.607011	7
54	.380624	8.50	.987092	.52	.393531	9.03	.606469	6
55	.381134	8.48	.987061	.52	.394073	9.03	.605927	5
56	.381643	8.48	.987030	.53	.394614	9.02	.605386	4
57	.382152	8.48	.986998	.52	.395154	9.00	.604846	3
58	.382661	8.45	.986967	.52	.395694	9.00	.604306	2
59	.383168	8.45	.986936	.53	.396233	8.98	.603767	1
60	9. 383675		9. 986904		9. 396771	8.97	10. 603229	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 383675	8. 45	9. 986904	.52	9. 396771	8. 97	10. 603229	60
1	.384182	8. 42	.986873	.53	.397309	8. 95	.602691	59
2	.384687	8. 42	.986841	.53	.397846	8. 95	.602154	58
3	.385192	8. 42	.986809	.52	.398383	8. 93	.601617	57
4	.385697	8. 40	.986778	.53	.398919	8. 93	.601081	56
5	.386201	8. 38	.986746	.53	.399455	8. 92	.600545	55
6	.386704	8. 38	.986714	.53	.399990	8. 90	.600010	54
7	.387207	8. 37	.986683	.52	.400524	8. 90	.599476	53
8	.387709	8. 35	.986651	.53	.401058	8. 88	.598942	52
9	.388210	8. 35	.986619	.53	.401591	8. 88	.598409	51
10	.388711	8. 33	.986587	.53	.402124	8. 87	.597876	50
11	9. 389211	8. 33	9. 986555	.53	9. 402656	8. 85	10. 597344	49
12	.389711	8. 32	.986523	.53	.403187	8. 85	.596813	48
13	.390210	8. 30	.986491	.53	.403718	8. 85	.596282	47
14	.390708	8. 30	.986459	.53	.404249	8. 82	.595751	46
15	.391206	8. 28	.986427	.53	.404778	8. 83	.595222	45
16	.391703	8. 27	.986395	.53	.405308	8. 80	.594692	44
17	.392199	8. 27	.986363	.53	.405836	8. 80	.594164	43
18	.392695	8. 27	.986331	.53	.406364	8. 80	.593636	42
19	.393191	8. 23	.986299	.55	.406892	8. 78	.593108	41
20	.393685	8. 23	.986266	.53	.407419	8. 77	.592581	40
21	9. 394179	8. 23	9. 986234	.53	9. 407945	8. 77	10. 592055	39
22	.394673	8. 22	.986202	.55	.408471	8. 75	.591529	38
23	.395166	8. 20	.986169	.53	.408996	8. 75	.591004	37
24	.395658	8. 20	.986137	.55	.409521	8. 73	.590479	36
25	.396150	8. 18	.986104	.53	.410045	8. 73	.589955	35
26	.396641	8. 18	.986072	.55	.410569	8. 72	.589431	34
27	.397132	8. 15	.986039	.53	.411092	8. 72	.588908	33
28	.397621	8. 17	.986007	.55	.411615	8. 70	.588385	32
29	.398111	8. 15	.985974	.53	.412137	8. 68	.587863	31
30	.398600	8. 13	.985942	.55	.412658	8. 68	.587342	30
31	9. 399088	8. 12	9. 985909	.55	9. 413179	8. 67	10. 586821	29
32	.399575	8. 12	.985876	.55	.413699	8. 67	.586301	28
33	.400062	8. 12	.985843	.53	.414219	8. 65	.585781	27
34	.400549	8. 10	.985811	.55	.414738	8. 65	.585262	26
35	.401035	8. 08	.985778	.55	.415257	8. 63	.584743	25
36	.401520	8. 08	.985745	.55	.415775	8. 63	.584225	24
37	.402005	8. 07	.985712	.55	.416293	8. 62	.583707	23
38	.402489	8. 05	.985679	.55	.416810	8. 60	.583190	22
39	.402972	8. 05	.985646	.55	.417326	8. 60	.582674	21
40	.403455	8. 05	.985613	.55	.417842	8. 60	.582158	20
41	9. 403938	8. 03	9. 985580	.55	9. 418358	8. 58	10. 581642	19
42	.404420	8. 02	.985547	.55	.418873	8. 57	.581127	18
43	.404901	8. 02	.985514	.57	.419387	8. 57	.580613	17
44	.405382	8. 00	.985480	.55	.419901	8. 57	.580099	16
45	.405862	7. 98	.985447	.55	.420415	8. 55	.579585	15
46	.406341	7. 98	.985414	.55	.420927	8. 55	.579073	14
47	.406820	7. 98	.985381	.57	.421440	8. 53	.578560	13
48	.407299	7. 97	.985347	.55	.421952	8. 52	.578048	12
49	.407777	7. 95	.985314	.57	.422463	8. 52	.577537	11
50	.408254	7. 95	.985280	.55	.422974	8. 50	.577026	10
51	9. 408731	7. 93	9. 985247	.57	9. 423484	8. 48	10. 576516	9
52	.409207	7. 93	.985213	.55	.423993	8. 50	.576007	8
53	.409682	7. 92	.985180	.57	.424503	8. 47	.575497	7
54	.410157	7. 92	.985146	.55	.425011	8. 47	.574989	6
55	.410632	7. 90	.985113	.57	.425519	8. 47	.574481	5
56	.411106	7. 88	.985079	.57	.426027	8. 45	.573973	4
57	.411579	7. 88	.985045	.57	.426534	8. 45	.573466	3
58	.412052	7. 87	.985011	.55	.427041	8. 43	.572959	2
59	.412524	7. 87	.984978	.57	.427547	8. 42	.572453	1
60	9. 412996		9. 984944		9. 428052		10. 571948	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 412996	7. 85	9. 984944	.57	9. 428052	8. 43	10. 571948	60
1	. 413467	7. 85	. 984910	.57	. 428558	8. 40	. 571442	59
2	. 413938	7. 83	. 984876	.57	. 429062	8. 40	. 570938	58
3	. 414408	7. 83	. 984842	.57	. 429566	8. 40	. 570434	57
4	. 414878	7. 82	. 984808	.57	. 430070	8. 38	569930	56
5	. 415347	7. 80	984774	.57	. 430573	8. 37	. 569427	55
6	. 415815	7. 80	. 984740	.57	. 431075	8. 37	. 568925	54
7	. 416283	7. 80	. 984706	.57	. 431577	8. 37	. 568423	53
8	. 416751	7. 77	. 984672	.57	. 432079	8. 35	. 567921	52
9	. 417217	7. 78	. 984638	.58	. 432580	8. 33	. 567420	51
10	. 417684	7. 77	. 984603	.57	. 433080	8. 33	. 566920	50
11	9. 418150	7. 75	9. 984569	.57	9. 433580	8. 33	10. 566420	49
12	. 418615	7. 73	. 984535	.58	. 434080	8. 32	. 565920	48
13	. 419079	7. 75	. 984500	.57	. 434579	8. 32	. 565421	47
14	. 419544	7. 72	. 984466	.57	. 435078	8. 30	. 564922	46
15	. 420007	7. 72	. 984432	.58	. 435576	8. 28	. 564424	45
16	420470	7. 72	. 984397	.57	. 436073	8. 28	. 563927	44
17	. 420933	7. 70	. 984363	.58	. 436570	8. 28	. 563430	43
18	. 421395	7. 70	. 984328	.57	. 437067	8. 27	. 562933	42
19	. 421857	7. 68	. 984294	.58	. 437563	8. 27	. 562437	41
20	. 422318	7. 67	. 984259	.58	. 438059	8. 25	. 561941	40
21	9. 422778	7. 67	. 984224	.57	9. 438554	8. 23	10. 561446	39
22	. 423238	7. 65	. 984190	.58	. 439048	8. 25	. 560952	38
23	. 423697	7. 65	. 984155	.58	. 439543	8. 22	. 560457	37
24	. 424156	7. 65	. 984120	.58	. 440036	8. 22	. 559964	36
25	. 424615	7. 63	. 984085	.58	. 440529	8. 22	. 559471	35
26	. 425073	7. 62	. 984050	.58	. 441022	8. 20	. 558978	34
27	425530	7. 62	. 984015	.57	. 441514	8. 20	. 558486	33
28	. 425987	7. 60	. 983981	.58	. 442006	8. 18	. 557994	32
29	. 426443	7. 60	. 983946	.58	. 442497	8. 18	. 557503	31
30	. 426899	7. 58	. 983911	.60	. 442988	8. 18	. 557012	30
31	9. 427354	7. 58	9. 983875	.58	9. 443479	8. 15	10. 556521	29
32	. 427809	7. 57	. 983840	.58	. 443968	8. 17	. 556032	28
33	. 428263	7. 57	. 983805	.58	. 444458	8. 15	. 555542	27
34	. 428717	7. 55	. 983770	.58	. 444947	8. 13	. 555053	26
35	. 429170	7. 55	. 983735	.58	. 445435	8. 13	. 554565	25
36	. 429623	7. 53	. 983700	.60	. 445923	8. 13	. 554077	24
37	. 430075	7. 53	. 983664	.58	. 446411	8. 12	. 553589	23
38	. 430527	7. 52	. 983629	.58	. 446898	8. 10	. 553102	22
39	. 430978	7. 52	. 983594	.60	. 447384	8. 10	. 552616	21
40	. 431429	7. 50	. 983558	.58	. 447870	8. 10	. 552130	20
41	9. 431879	7. 50	9. 983523	.60	9. 448356	8. 08	10 551644	19
42	. 432329	7. 48	. 983487	.58	. 448841	8. 08	. 551159	18
43	. 432778	7. 47	. 983452	.60	. 449326	8. 07	. 550674	17
44	. 433226	7. 48	. 983416	.58	. 449810	8. 07	. 550190	16
45	. 433675	7. 45	. 983381	.60	. 450294	8. 05	. 549706	15
46	. 434122	7. 45	. 983345	.60	. 450777	8. 05	. 549223	14
47	. 434569	7. 45	. 983309	.60	. 451260	8. 05	. 548740	13
48	. 435016	7. 43	. 983273	.58	. 451743	8. 03	. 548257	12
49	. 435462	7. 43	. 983238	.60	. 452225	8. 02	. 547775	11
50	. 435908	7. 42	. 983202	.60	. 452706	8. 02	. 547294	10
51	9. 436353	7. 42	9. 983166	.60	9. 453187	8. 02	10. 546813	9
52	. 436798	7. 40	. 983130	.60	. 453668	8. 00	. 546332	8
53	. 437242	7. 40	. 983094	.60	. 454148	8. 00	. 545852	7
54	. 437686	7. 38	. 983058	.60	. 454628	7. 98	. 545372	6
55	. 438129	7. 38	. 983022	.60	. 455107	7. 98	. 544893	5
56	. 438572	7. 37	. 982986	.60	. 455586	7. 97	. 544414	4
57	. 439014	7. 37	. 982950	.60	. 456064	7. 97	. 543936	3
58	. 439456	7. 35	. 982914	.60	. 456542	7. 95	. 543458	2
59	. 439897	7. 35	. 982878	.60	. 457019	7. 95	. 542981	1
60	9. 440338		9. 982842		9. 457496		10. 542404	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 440338	7. 33	9. 982842	.62	9. 457496	7. 95	10. 542504	60
1	.440778	7. 33	.982805	.60	.457973	7. 93	.542027	59
2	.441218	7. 33	.982769	.60	.458449	7. 93	.541551	58
3	.441658	7. 30	.982733	.62	.458925	7. 92	.541075	57
4	.442096	7. 32	.982696	.60	.459400	7. 92	.540600	56
5	.442535	7 30	.982660	.60	.459875	7. 90	.540125	55
6	.442973	7. 28	.982624	.62	.460349	7. 90	.539651	54
7	.443410	7. 28	.982587	.60	.460823	7. 90	.539177	53
8	.443847	7. 28	.982551	.62	.461297	7. 88	.538703	52
9	.444284	7. 27	.982514	.62	.461770	7. 87	.538230	51
10	.444720	7. 25	.982477	.60	.462242	7. 88	.537758	50
11	9. 445155	7. 25	9. 982441	.62	9. 462715	7. 85	10. 537285	49
12	.445590	7. 25	.982404	.62	.463186	7. 87	.536814	48
13	.446025	7. 23	.982367	.60	.463658	7. 83	.536342	47
14	.446459	7. 23	.982331	.62	.464128	7. 85	.535872	46
15	.446893	7. 22	.982294	.62	.464599	7. 83	.535401	45
16	.447326	7. 22	.982257	.62	.465069	7. 83	.534931	44
17	.447759	7. 20	.982220	.62	.465539	7. 82	.534461	43
18	.448191	7. 20	.982183	.62	.466008	7. 82	.533992	42
19	.448623	7. 18	.982146	.62	.466477	7. 80	.533523	41
20	.449054	7. 18	.982109	.62	.466945	7. 80	.533055	40
21	9. 449485	7. 17	9. 982072	.62	9. 467413	7. 78	10. 532587	39
22	.449915	7. 17	.982035	.62	.467880	7 78	.532120	38
23	.450345	7. 17	.981998	.62	.468347	7. 78	.531653	37
24	.450775	7. 15	.981961	.62	.468814	7. 77	.531186	36
25	.451204	7. 13	.981924	.63	.469280	7. 77	.530720	35
26	.451632	7. 13	.981886	.62	.469746	7. 75	.530254	34
27	.452060	7. 13	.981849	.62	.470211	7. 75	.529789	33
28	.452488	7. 12	.981812	.63	.470676	7. 75	.529324	32
29	.452915	7. 12	.981774	.62	.471141	7. 73	.528859	31
30	.453342	7. 10	.981737	.62	.471605	7. 73	.528395	30
31	9. 453768	7. 10	9. 981700	.63	9. 472069	7. 72	10. 527931	29
32	454194	7. 08	.981662	.62	.472532	7. 72	.527468	28
33	454619	7. 08	.981625	.63	.472995	7. 70	.527005	27
34	.455044	7. 08	.981587	.63	.473457	7. 70	.526543	26
35	.455469	7. 07	.981549	.62	.473919	7. 70	.526081	25
36	.455893	7. 05	.981512	.63	.474381	7. 68	.525619	24
37	.456316	7. 05	.981474	.63	.474842	7. 68	.525158	23
38	.456739	7. 05	.981436	.62	.475303	7. 67	.524697	22
39	.457162	7. 03	.981399	.63	.475763	7. 67	.524237	21
40	.457584	7. 03	.981361	.63	.476223	7. 67	.523777	20
41	9. 458006	7. 02	9. 981323	.63	9. 476683	7. 65	10. 523317	19
42	.458427	7. 02	.981285	.63	.477142	7. 65	.522858	18
43	.458848	7. 00	.981247	.63	.477601	7. 63	.522399	17
44	.459268	7. 00	.981209	.63	.478059	7. 63	.521941	16
45	.459688	7. 00	.981171	.63	.478517	7. 63	.521483	15
46	.460108	6 98	.981133	.63	.478975	7. 62	.521025	14
47	.460527	6. 98	.981095	.63	.479432	7. 62	.520568	13
48	.460946	6. 97	.981057	.63	.479889	7. 60	.520111	12
49	.461364	6. 97	.981019	.63	.480345	7. 60	.519655	11
50	.461782	6. 95	.980981	.65	.480801	7. 60	.519199	10
51	9. 462199	6. 95	9. 980942	.63	9. 481257	7. 58	10. 518743	9
52	.462616	6. 93	.980904	.63	.481712	7. 58	.518288	8
53	.463032	6. 93	.980866	.65	.482167	7. 57	.517833	7
54	.463448	6. 93	.980827	.63	.482621	7. 57	.517379	6
55	.463864	6. 92	.980789	.65	.483075	7. 57	.516925	5
56	.464279	6. 92	.980750	63	.483529	7. 55	.516471	4
57	.464694	6. 90	.980712	.65	.483982	7. 55	.516018	3
58	.465108	6. 90	.980673	.63	.484435	7. 53	.515565	2
59	.465522	6. 88	.980635	.65	.484887	7. 53	.515113	1
60	9. 465935		9. 980596		9. 485339		10. 514661	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 465935		9. 980596		9. 485339		10. 514661	60
1	. 466348	6. 88	. 980558	.63	. 485791	7. 53	. 514209	59
2	. 466761	6. 88	. 980519	.65	. 486242	7. 52	. 513758	58
3	. 467173	6. 87	. 980480	65	. 486693	7. 52	. 513307	57
4	. 467585	6. 87	. 980442	.63	. 487143	7. 50	. 512857	56
5	. 467996	6. 85	. 980403	.65	. 487593	7. 50	. 512407	55
6	. 468407	6. 85	. 980364	.65	. 488043	7. 50	. 511957	54
7	. 468817	6. 83	980325	.65	. 488492	7. 48	. 511508	53
8	. 469227	6. 83	. 980286	.65	. 488941	7. 48	. 511059	52
9	. 469637	6. 83	. 980247	.65	. 489390	7. 48	. 510610	51
10	. 470046	6. 82	. 980208	.65	. 489838	7. 47	. 510162	50
11	9. 470455		9. 980169		9. 490286	7. 47	10. 509714	49
12	. 470863	6. 80	. 980130	.65	. 490733	7. 45	. 509267	48
13	. 471271	6. 80	. 980091	.65	. 491180	7. 45	. 508820	47
14	. 471679	6. 80	. 980052	.65	. 491627	7. 45	. 508373	46
15	. 472086	6. 78	. 980012	.67	. 492073	7. 43	. 507927	45
16	. 472492	6. 77	. 979973	.65	. 492519	7. 43	. 507481	44
17	. 472898	6. 77	. 979934	.65	. 492965	7. 43	. 507035	43
18	. 473304	6. 77	. 979895	.65	. 493410	7. 42	. 506590	42
19	. 473710	6. 77	. 979855	.67	. 493854	7. 40	. 506146	41
20	. 474115	6. 75	. 979816	.65	. 494299	7. 42	. 505701	40
21	9. 474519	6. 73	9. 979776	.67	9. 494743	7. 40	10. 505257	39
22	. 474923	6. 73	. 979737	.65	. 495186	7. 38	. 504814	38
23	. 475327	6. 72	. 979697	.67	. 495630	7. 40	. 504370	37
24	. 475730	6. 72	. 979658	.65	. 496073	7. 38	. 503927	36
25	. 476133	6. 72	. 979618	.67	. 496515	7. 37	. 503485	35
26	. 476536	6. 70	. 979579	.65	496957	7. 37	. 503043	34
27	. 476938	6. 70	. 979539	.67	. 497399	7. 37	. 502601	33
28	. 477340	6. 68	. 979499	.67	. 497841	7. 37	. 502159	32
29	. 477741	6 68	. 979459	.67	. 498282	7. 35	. 501718	31
30	. 478142	6. 67	. 979420	.65	. 498722	7. 33	. 501278	30
31	9. 478542		9. 979380	.67	9. 499163	7. 35	10. 500837	29
32	. 478942	6. 67	. 979340	.67	. 499603	7. 33	. 500397	28
33	. 479342	6. 67	. 979300	.67	. 500042	7. 32	. 499958	27
34	. 479741	6. 65	. 979260	.67	. 500481	7. 32	. 499519	26
35	. 480140	6. 65	. 979220	.67	. 500920	7. 32	. 499080	25
36	. 480539	6. 65	. 979180	.67	. 501359	7. 32	. 498641	24
37	. 480937	6. 63	. 979140	.67	. 501797	7. 30	. 498203	23
38	. 481334	6 62	. 979100	.67	. 502235	7. 30	. 497765	22
39	. 481731	6. 62	. 979059	.68	. 502672	7. 28	. 497328	21
40	. 482128	6. 62	. 979019	.67	. 503109	7. 28	. 496891	20
41	9. 482525	6. 62	9. 978979	.67	9. 503546	7. 28	10. 496454	19
42	. 482921	6. 60	. 978939	.68	. 503982	7. 27	. 496018	18
43	. 483316	6. 58	. 978898	.67	. 504418	7. 27	. 495582	17
44	. 483712	6. 60	. 978858	.68	. 504854	7. 27	. 495146	16
45	. 484107	6. 58	. 978817	.67	. 505289	7. 25	. 494711	15
46	. 484501	6. 57	. 978777	.67	. 505724	7. 25	. 494276	14
47	. 484895	6. 57	. 978737	.68	. 506159	7. 25	. 493841	13
48	. 485289	6. 57	. 978696	.68	. 506593	7. 23	. 493407	12
49	. 485682	6 55	. 978655	.67	. 507027	7. 23	. 492973	11
50	. 486075	6. 55	. 978615	.68	. 507460	7. 23	. 492540	10
51	9. 486467	6. 53	9. 978574	.68	9. 507893	7. 22	10. 492107	9
52	. 486860	6. 55	. 978533	.67	. 508326	7. 22	. 491674	8
53	. 487251	6. 52	. 978493	.68	. 508759	7. 22	. 491241	7
54	. 487643	6. 53	. 978452	.68	. 509191	7. 20	. 490809	6
55	. 488034	6. 52	. 978411	.68	. 509622	7. 18	. 490378	5
56	. 488424	6. 50	. 978370	.68	. 510054	7. 20	. 489946	4
57	. 488814	6. 50	. 978329	.68	. 510485	7. 18	. 489515	3
58	. 489204	6. 50	. 978288	.68	. 510916	7. 18	. 489084	2
59	. 489593	6. 48	. 978247	.68	. 511346	7. 17	. 488654	1
60	9. 489982	6. 48	9. 978206	.68	9. 511776	7. 17	10. 488224	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 489982	6. 48	9. 978206	.68	9. 511776	7. 17	10. 488224	60
1	.490371	6. 47	.978165	.68	.512206	7. 15	.487794	59
2	.490759	6. 47	.978124	.68	512635	7. 15	.487365	58
3	.491147	6. 47	.978083	.68	.513064	7 15	.486936	57
4	.491535	6. 45	.978042	.68	.513493	7. 13	.486507	56
5	.491922	6. 43	.978001	.70	.513921	7. 13	.486079	55
6	.492308	6. 45	.977959	.68	.514349	7 13	.485651	54
7	.492695	6. 43	.977918	.68	.514777	7. 12	.485223	53
8	.493081	6. 42	.977877	.70	.515204	7. 12	.484796	52
9	.493466	6. 42	.977835	.68	.515631	7. 10	.484369	51
10	.493851	6. 42	.977794	.70	.516057	7. 12	.483943	50
11	9. 494236	6. 42	9. 977752	.68	9. 516484	7. 10	10. 483516	49
12	.494621	6. 40	.977711	.70	.516910	7. 08	.483090	48
13	.495005	6. 38	.977669	.68	.517335	7. 10	.482665	47
14	.495388	6. 40	.977628	.70	.517761	7 08	.482239	46
15	.495772	6. 37	977586	.70	.518186	7. 07	.481814	45
16	.496154	6. 38	.977544	68	.518610	7. 07	.481390	44
17	.496537	6. 37	.977503	.70	.519034	7. 07	.480966	43
18	.496919	6. 37	.977461	.70	.519458	7. 07	480542	42
19	.497301	6. 35	.977419	.70	.519882	7. 05	.480118	41
20	.497682	6. 35	.977377	.70	.520305	7. 05	.479695	40
21	9. 498064	6. 33	9. 977335	.70	9. 520728	7. 05	10 479272	39
22	.498444	6. 35	.977293	.70	.521151	7. 03	.478849	38
23	.498825	6. 32	.977251	.70	.521573	7. 03	.478427	37
24	.499204	6. 33	.977209	.70	.521995	7 03	.478005	36
25	.499584	6. 32	.977167	.70	.522417	7. 02	.477583	35
26	.499963	6. 32	.977125	.70	.522838	7. 02	.477162	34
27	.500342	6. 32	.977083	.70	.523259	7. 02	.476741	33
28	.500721	6. 30	.977041	.70	.523680	7. 00	.476320	32
29	.501099	6. 28	.976999	.70	.524100	7. 00	.475900	31
30	.501476	6. 30	.976957	.72	.524520	7. 00	.475480	30
31	9. 501854	6. 28	9. 976914	.70	9. 524940	6. 98	10. 475060	29
32	.502231	6. 27	.976872	.70	.525359	6. 98	.474641	28
33	.502607	6. 28	.976830	.72	.525778	6. 98	.474222	27
34	.502984	6. 27	.976787	.72	.526197	6. 97	.473803	26
35	.503360	6. 25	976745	.70	.526615	6. 97	.473385	25
36	.503735	6. 25	.976702	.72	.527033	6. 97	.472967	24
37	.504110	6. 25	.976660	.70	.527451	6. 95	.472549	23
38	.504485	6. 25	.976617	.72	.527868	6. 95	.472132	22
39	.504860	6. 23	.976574	.72	.528285	6. 95	.471715	21
40	.505234	6 23	.976532	.70	.528702	6. 95	.471298	20
41	9. 505608	6. 22	9. 976489	.72	9. 529119	6. 93	10. 470881	19
42	.505981	6. 22	.976446	.72	.529535	6. 93	.470465	18
43	.506354	6. 22	.976404	.70	.529951	6. 92	.470049	17
44	.506727	6. 20	.976361	.72	.530366	6. 92	.469634	16
45	.507099	6. 20	.976318	.72	.530781	6 92	.469219	15
46	.507471	6 20	.976275	.72	.531196	6. 92	.468804	14
47	.507843	6. 18	.976232	.72	531611	6 90	.468389	13
48	.508214	6. 18	.976189	.72	.532025	6. 90	467975	12
49	.508585	6. 18	.976146	.72	.532439	6. 90	.467561	11
50	.508956	6. 17	.976103	.72	.532853	6. 88	.467147	10
51	9. 509326	6. 17	9. 976060	.72	9. 533266	6. 88	10. 466734	9
52	.509696	6. 15	.976017	.72	.533679	6. 88	.466321	8
53	.510065	6. 15	.975974	.73	.534092	6. 87	.465908	7
54	.510434	6. 15	.975930	.72	.534504	6. 87	.465496	6
55	.510803	6. 15	.975887	.72	.534916	6. 87	.465084	5
56	.511172	6. 13	.975844	.73	.535328	6. 85	.464672	4
57	.511540	6. 12	.975800	.72	.535739	6. 85	.464261	3
58	.511907	6. 13	.975757	.72	.536150	6. 85	.463850	2
59	.512275	6. 12	.975714	.73	.536561	6. 85	.463439	1
60	9. 512642		9. 975670		9. 536972		10. 463028	0
′	Cosine.	D. 1″.	Sine.	D. 1″	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 512642		9. 975670		9. 536972		10. 463028	60
1	.513009	6.12	.975627	.72	.537382	6.83	.462618	59
2	.513375	6.10	.975583	.73	.537792	6.83	.462208	58
3	.513741	6.10	.975539	.73	.538202	6.83	.461798	57
4	.514107	6.10	.975496	.72	.538611	6.82	.461389	56
5	.514472	6.08	.975452	.73	.539020	6.82	.460980	55
6	.514837	6.08	.975408	.73	.539429	6.82	.460571	54
7	.515202	6.08	.975365	.72	.539837	6.80	.460163	53
8	.515566	6.07	.975321	.73	.540245	6.80	.459755	52
9	.515930	6.07	.975277	.73	.540653	6.80	.459347	51
10	.516294	6.07	.975233	.73	.541061	6.78	.458939	50
11	9. 516657	6.05	9. 975189	.73	9. 541468	6.78	10. 458532	49
12	.517020	6.03	.975145	.73	.541875	6.77	.458125	48
13	.517382	6.05	.975101	.73	.542281	6.78	.457719	47
14	.517745	6.03	.975057	.73	.542688	6.77	.457312	46
15	.518107	6.02	.975013	.73	.543094	6.75	.456906	45
16	.518468	6.02	.974969	.73	.543499	6.77	.456501	44
17	.518829	6.02	.974925	.75	.543905	6.75	.456095	43
18	.519190	6.02	.974880	.73	.544310	6.75	.455690	42
19	.519551	6.00	.974836	.73	.544715	6.73	.455285	41
20	.519911	6.00	.974792	.73	.545119	6.75	.454881	40
21	9. 520271	6.00	9. 974748	.75	9. 545524	6.73	10. 454476	39
22	.520631	5.98	.974703	.73	.545928	6.72	.454072	38
23	.520990	5.98	.974659	.75	.546331	6.73	.453669	37
24	.521349	5.97	.974614	.73	.546735	6.72	.453265	36
25	.521707	5.98	.974570	.75	.547138	6.70	.452862	35
26	.522066	5.97	.974525	.73	.547540	6.72	.452460	34
27	.522424	5.95	.974481	.75	.547943	6.70	.452057	33
28	.522781	5.95	.974436	.75	.548345	6.70	.451655	32
29	.523138	5.95	.974391	.73	.548747	6.70	.451253	31
30	.523495	5.95	.974347	.75	.549149	6.68	.450851	30
31	9. 523852	5.93	9. 974302	.75	9. 549550	6.68	10. 450450	29
32	.524208	5.93	.974257	.75	.549951	6.68	.450049	28
33	.524564	5.93	.974212	.75	.550352	6.67	.449648	27
34	.524920	5.92	.974167	.75	.550752	6.68	.449248	26
35	.525275	5.92	.974122	.75	.551153	6.65	.448847	25
36	.525630	5.90	.974077	.75	.551552	6.67	.448448	24
37	.525984	5.92	.974032	.75	.551952	6.65	.448048	23
38	.526339	5.90	.973987	.75	.552351	6.65	.447649	22
39	.526693	5.88	.973942	.75	.552750	6.65	.447250	21
40	.527046	5.90	.973897	.75	.553149	6.65	.446851	20
41	9. 527400	5.88	9. 973852	.75	9. 553548	6.63	10. 446452	19
42	.527753	5.87	.973807	.77	.553946	6.63	.446054	18
43	.528105	5.88	.973761	.75	.554344	6.62	.445656	17
44	.528458	5.87	.973716	.75	.554741	6.63	.445259	16
45	.528810	5.85	.973671	.77	.555139	6.62	.444861	15
46	.529161	5.87	.973625	.75	.555536	6.62	.444464	14
47	.529513	5.85	.973580	.75	.555933	6.60	.444067	13
48	.529864	5.85	.973535	.75	.556329	6.60	.443671	12
49	.530215	5.83	.973489	.77	.556725	6.60	.443275	11
50	.530565	5.83	.973444	.77	.557121	6.60	.442879	10
51	9. 530915	5.83	9. 973398	.77	9. 557517	6.60	10. 442483	9
52	.531265	5.82	.973352	.75	.557913	6.58	.442087	8
53	.531614	5.82	.973307	.77	.558308	6.58	.441692	7
54	.531963	5.82	.973261	.77	.558703	6.57	.441297	6
55	.532312	5.82	.973215	.77	.559097	6.57	.440903	5
56	.532661	5.80	.973169	.77	.559491	6.57	.440509	4
57	.533009	5.80	.973124	.75	.559885	6.57	.440115	3
58	.533357	5.78	.973078	.77	.560279	6.57	.439721	2
59	.533704	5.80	.973032	.77	.560673	6.55	.439327	1
60	9. 534052		9. 972986		9. 561066		10. 438934	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 534052	5. 78	9. 972986	.77	9. 561066	6. 55	10. 438934	60
1	.534399	5. 77	.972940	.77	.561459	6. 53	.438541	59
2	.534745	5. 78	.972894	.77	.561851	6. 55	.438149	58
3	.535092	5. 77	.972848	.77	.562244	6. 53	.437756	57
4	.535438	5. 75	.972802	.78	.562636	6. 53	.437364	56
5	.535783	5. 77	.972755	.77	.563028	6. 52	.436972	55
6	.536129	5. 75	.972709	.77	.563419	6. 53	.436581	54
7	.536474	5. 73	.972663	.77	.563811	6. 52	.436189	53
8	.536818	5. 75	.972617	.78	.564202	6. 52	.435798	52
9	.537163	5. 73	.972570	.77	.564593	6. 50	.435407	51
10	.537507	5. 73	.972524	.77	.564983	6. 50	.435017	50
11	9. 537851	5. 72	9. 972478	.78	9. 565373	6. 50	10. 434627	49
12	.538194	5. 73	.972431	.77	.565763	6. 50	.434237	48
13	.538538	5. 70	.972385	.78	.566153	6. 48	.433847	47
14	.538880	5. 72	.972338	.78	.566542	6. 50	.433458	46
15	.539223	5. 70	.972291	.77	.566932	6. 47	.433068	45
16	.539565	5. 70	.972245	.78	.567320	6. 48	.432680	44
17	.539907	5. 68	.972198	.78	.567709	6. 48	.432291	43
18	.540249	5. 68	.972151	.77	.568098	6. 47	.431902	42
19	.540590	5. 68	.972105	.78	.568486	6. 45	.431514	41
20	.540931	5. 68	.972058	.78	.568873	6. 47	.431127	40
21	9. 541272	5. 68	9. 972011	.78	9. 569261	6. 45	10. 430739	39
22	.541613	5. 67	.971964	.78	.569648	6. 45	.430352	38
23	.541953	5. 67	.971917	.78	.570035	6. 45	.429965	37
24	.542293	5. 65	.971870	.78	.570422	6. 45	.429578	36
25	.542632	5. 65	.971823	.78	.570809	6. 43	.429191	35
26	.542971	5. 65	.971776	.78	.571195	6. 43	.428805	34
27	.543310	5. 65	.971729	.78	.571581	6. 43	.428419	33
28	.543649	5. 63	.971682	.78	.571967	6. 42	.428033	32
29	.543987	5. 63	.971635	.78	.572352	6. 43	.427648	31
30	.544325	5. 63	.971588	.80	.572738	6. 42	.427262	30
31	9. 544663	5. 62	9. 971540	.78	9. 573123	6. 40	10. 426877	29
32	.545000	5. 63	.971493	.78	.573507	6. 42	.426493	28
33	.545338	5. 60	.971446	.80	.573892	6. 40	.426108	27
34	.545674	5. 62	.971398	.78	.574276	6. 40	.425724	26
35	.546011	5. 60	.971351	.80	.574660	6. 40	.425340	25
36	.546347	5. 60	.971303	.78	.575044	6. 38	.424956	24
37	.546683	5. 60	.971256	.80	.575427	6. 38	.424573	23
38	.547019	5. 58	.971208	.78	.575810	6. 38	.424190	22
39	.547354	5. 58	.971161	.80	.576193	6. 38	.423807	21
40	.547689	5. 58	.971113	.78	.576576	6. 38	.423424	20
41	9. 548024	5. 58	9. 971066	.80	9. 576959	6. 37	10. 423041	19
42	.548359	5. 57	.971018	.80	.577341	6. 37	.422659	18
43	.548693	5. 57	.970970	.80	.577723	6. 35	.422277	17
44	.549027	5. 55	.970922	.80	.578104	6. 37	.421896	16
45	.549360	5. 55	.970874	.78	.578486	6. 35	.421514	15
46	.549693	5. 55	.970827	.80	.578867	6. 35	.421133	14
47	.550026	5. 55	.970779	.80	.579248	6. 35	.420752	13
48	.550359	5. 55	.970731	.80	.579629	6. 33	.420371	12
49	.550692	5. 53	.970683	.80	.580009	6. 33	.419991	11
50	.551024	5. 53	.970635	.82	.580389	6. 33	.419611	10
51	9. 551356	5. 52	9. 970586	.80	9. 580769	6. 33	10. 419231	9
52	.551687	5. 52	.970538	.80	.581149	6. 32	.418851	8
53	.552018	5. 52	.970490	.80	.581528	6. 32	.418472	7
54	.552349	5. 52	.970442	.80	.581907	6. 32	.418093	6
55	.552680	5. 50	.970394	.82	.582286	6. 32	.417714	5
56	.553010	5. 52	.970345	.80	.582665	6. 32	.417335	4
57	.553341	5. 48	.970297	.80	.583044	6. 30	.416956	3
58	.553670	5. 50	.970249	.82	.583422	6. 30	.416578	2
59	.554000	5. 48	.970200	.80	.583800	6. 28	.416200	1
60	9. 554329		9. 970152		9. 584177		10. 415823	0
′	Cosine.	D 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 554329		9. 970152		9. 584177		10. 415823	60
1	.554658	5. 48	.970103	.82	.584555	6. 30	.415445	59
2	.554987	5. 48	.970055	.80	.584932	6. 28	.415068	58
3	.555315	5. 47	.970006	.82	.585309	6. 28	.414691	57
4	.555643	5. 47	.969957	.82	.585686	6. 28	.414314	56
5	.555971	5. 47	.969909	.80	.586062	6. 27	.413938	55
6	.556299	5. 47	.969860	.82	.586439	6. 28	.413561	54
7	.556626	5. 45	.969811	.82	.586815	6. 27	.413185	53
8	.556953	5. 45	.969762	.82	.587190	6. 25	.412810	52
9	.557280	5. 45	.969714	.80	.587566	6. 27	.412434	51
10	.557606	5. 43	.969665	.82	.587941	6. 25	.412059	50
11	9. 557932	5. 43	9. 969616	.82	9. 588316	6. 25	10. 411684	49
12	.558258	5. 42	.969567	.82	.588691	6. 25	.411309	48
13	.558583	5. 43	.969518	.82	.589066	6. 23	.410934	47
14	.558909	5. 42	.969469	.82	.589440	6. 23	.410560	46
15	.559234	5. 40	.969420	.83	.589814	6. 23	.410186	45
16	.559558	5. 42	.969370	.82	.590188	6. 23	.409812	44
17	.559883	5. 40	.969321	.82	.590562	6. 22	.409438	43
18	.560207	5. 40	.969272	.82	.590935	6. 22	.409065	42
19	.560531	5. 40	.969223	.82	.591308	6. 22	.408692	41
20	.560855	5. 38	.969173	.83	.591681	6. 22	.408319	40
21	9. 561178	5. 38	9. 969124	.82	9. 592054	6. 20	10. 407946	39
22	.561501	5. 38	.969075	.83	.592426	6. 22	.407574	38
23	.561824	5. 37	.969025	.82	.592799	6. 20	.407201	37
24	.562146	5. 37	.968976	.83	.593171	6. 18	.406829	36
25	.562468	5. 37	.968926	.82	.593542	6. 20	.406458	35
26	.562790	5. 37	.968877	.83	.593914	6. 18	.406086	34
27	.563112	5. 35	.968827	.83	.594285	6. 18	.405715	33
28	.563433	5. 37	.968777	.83	.594656	6. 18	.405344	32
29	.563755	5. 33	.968728	.82	.595027	6. 18	.404973	31
30	.564075	5. 35	.968678	.83	.595398	6. 17	.404602	30
31	9. 564396	5. 33	9. 968628	.83	9. 595768	6. 17	10. 404232	29
32	.564716	5. 33	.968578	.83	.596138	6. 17	.403862	28
33	.565036	5. 33	.968528	.82	.596508	6. 17	.403492	27
34	.565356	5. 33	.968479	.83	.596878	6. 15	.403122	26
35	.565676	5. 32	.968429	.83	.597247	6. 15	.402753	25
36	.565995	5. 32	.968379	.83	.597616	6. 15	.402384	24
37	.566314	5. 30	.968329	.85	.597985	6. 15	.402015	23
38	.566632	5. 32	.968278	.83	.598354	6. 13	.401646	22
39	.566951	5. 30	.968228	.83	.598722	6. 15	.401278	21
40	.567269	5. 30	.968178	.83	.599091	6. 13	.400909	20
41	9. 567587	5. 28	9. 968128	.83	9. 599459	6. 13	10. 400541	19
42	.567904	5. 30	.968078	.85	.599827	6. 12	.400173	18
43	.568222	5. 28	.968027	.83	.600194	6. 13	.399806	17
44	.568539	5. 28	.967977	.83	.600562	6. 12	.399438	16
45	.568856	5. 27	.967927	.85	.600929	6. 12	.399071	15
46	.569172	5. 27	.967876	.83	.601296	6. 12	.398704	14
47	.569488	5. 27	.967826	.85	.601663	6. 10	.398337	13
48	.569804	5. 27	.967775	.83	.602029	6. 10	.397971	12
49	.570120	5. 25	.967725	.85	.602395	6. 10	.397605	11
50	.570435	5. 27	.967674	.83	.602761	6. 10	.397239	10
51	9. 570751	5. 25	9. 967624	.85	9. 603127	6. 10	10. 396873	9
52	.571066	5. 23	.967573	.85	.603493	6. 08	.396507	8
53	.571380	5. 25	.967522	.85	.603858	6. 08	.396142	7
54	.571695	5. 23	.967471	.83	.604223	6. 08	.395777	6
55	.572009	5. 23	.967421	.85	.604588	6. 08	.395412	5
56	.572323	5. 22	.967370	.85	.604953	6. 07	.395047	4
57	.572636	5. 23	.967319	.85	.605317	6. 08	.394683	3
58	.572950	5. 22	.967268	.85	.605682	6. 07	.394318	2
59	.573263	5. 20	.967217	.85	.606046	6. 07	.393954	1
60	9. 573575		9. 967166	.85	9. 606410		10. 393590	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 573575	5. 22	9. 967166	.85	9. 606410	6. 05	10 393590	60
1	.573888	5. 20	.967115	.85	.606773	6. 07	.393227	59
2	.574200	5. 20	.967064	.85	.607137	6. 05	.392863	58
3	.574512	5. 20	.967013	.87	.607500	6. 05	.392500	57
4	.574824	5. 20	.966961	.85	.607863	6. 03	.392137	56
5	.575136	5. 18	.966910	.85	.608225	6. 05	.391775	55
6	.575447	5. 18	.966859	.85	.608588	6. 03	.391412	54
7	.575758	5. 18	.966808	.87	.608950	6. 03	.391050	53
8	.576069	5. 17	.966756	.85	.609312	6. 03	.390688	52
9	.576379	5. 17	.966705	.87	.609674	6. 03	.390326	51
10	.576689	5. 17	.966653	.85	.610036	6. 02	.389964	50
11	9. 576999	5. 17	9. 966602	.87	9. 610397	6. 03	10. 389603	49
12	.577309	5. 15	.966550	.85	.610759	6. 02	.389241	48
13	.577618	5. 15	.966499	.87	.611120	6. 00	.388880	47
14	.577927	5. 15	.966447	.87	.611480	6. 02	.388520	46
15	.578236	5. 15	.966395	.85	.611841	6. 00	.388159	45
16	.578545	5. 13	.966344	.87	.612201	6. 00	.387799	44
17	.578853	5. 15	.966292	.87	.612561	6. 00	.387439	43
18	.579162	5. 13	.966240	.87	.612921	6. 00	.387079	42
19	.579470	5. 12	.966188	.87	.613281	6. 00	.386719	41
20	.579777	5. 13	.966136	.85	.613641	5. 98	.386359	40
21	9. 580085	5. 12	9. 966085	.87	9. 614000	5. 98	10. 386000	39
22	.580392	5. 12	.966033	.87	.614359	5. 98	.385641	38
23	.580699	5. 10	.965981	.87	.614718	5. 98	.385282	37
24	.581005	5. 12	.965929	.88	.615077	5. 97	.384923	36
25	.581312	5. 10	.965876	.87	.615435	5. 97	.384565	35
26	.581618	5. 10	.965824	.87	.615793	5. 97	.384207	34
27	.581924	5. 08	.965772	.87	.616151	5. 97	.383849	33
28	.582229	5. 10	.965720	.87	.616509	5. 97	.383491	32
29	.582535	5. 08	.965668	.88	.616867	5. 95	.383133	31
30	.582840	5. 08	.965615	.87	.617224	5. 97	.382776	30
31	9. 583145	5. 07	9. 965563	.87	9. 617582	5. 95	10. 382418	29
32	.583449	5. 08	.965511	.88	.617939	5. 93	.382061	28
33	.583754	5. 07	.965458	.87	.618295	5. 95	.381705	27
34	.584058	5. 05	.965406	.88	.618652	5. 93	.381348	26
35	.584361	5. 07	.965353	.87	.619008	5. 93	.380992	25
36	.584665	5. 05	.965301	.88	.619364	5. 93	.380636	24
37	.584968	5. 07	.965248	.88	.619720	5. 93	.380280	23
38	.585272	5. 03	.965195	.87	.620076	5. 93	.379924	22
39	.585574	5. 05	.965143	.88	.620432	5. 92	.379568	21
40	.585877	5. 03	.965090	.88	.620787	5. 92	.379213	20
41	9. 586179	5. 05	9. 965037	.88	9. 621142	5. 92	10. 378858	19
42	.586482	5. 02	.964984	.88	.621497	5. 92	.378503	18
43	.586783	5. 03	.964931	.87	.621852	5. 92	.378148	17
44	.587085	5. 02	.964879	.88	.622207	5. 90	.377793	16
45	.587386	5. 03	.964826	.88	.622561	5. 90	.377439	15
46	.587688	5. 02	.964773	.88	.622915	5. 90	.377085	14
47	.587989	5. 00	.964720	.90	.623269	5. 90	.376731	13
48	.588289	5. 02	.964666	.88	.623623	5. 88	.376377	12
49	.588590	5. 00	.964613	.88	.623976	5. 90	.376024	11
50	.588890	5. 00	.964560	.88	.624330	5. 88	.375670	10
51	9. 589190	4. 98	9. 964507	.88	9. 624683	5. 88	10. 375317	9
52	.589489	5. 00	.964454	.90	.625036	5. 87	.374964	8
53	.589789	4. 98	.964400	.88	.625388	5. 88	.374612	7
54	.590088	4. 98	.964347	.88	.625741	5. 87	.374259	6
55	.590387	4. 98	.964294	.90	.626093	5. 87	.373907	5
56	.590686	4. 97	.964240	.88	.626445	5. 87	.373555	4
57	.590984	4. 97	.964187	.90	.626797	5. 87	.373203	3
58	.591282	4. 97	.964133	.88	.627149	5. 87	.372851	2
59	.591580	4. 97	.964080	.90	.627501	5. 85	.372499	1
60	9. 591878		9. 964026		9. 627852		10. 372148	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 591878	4. 97	9. 964026	.90	9. 627852	5. 85	10. 372148	60
1	.592176	4. 95	.963972	.88	.628203	5. 85	.371797	59
2	.592473	4. 95	.963919	.90	.628554	5. 85	.371446	58
3	.592770	4. 95	.963865	.90	.628905	5. 83	.371095	57
4	.593067	4. 93	.963811	.90	.629255	5. 85	.370745	56
5	.593363	4. 93	.963757	.88	.629606	5. 83	.370394	55
6	.593659	4. 93	.963704	.90	.629956	5. 83	.370044	54
7	.593955	4. 93	.963650	.90	.630306	5. 83	.369694	53
8	.594251	4. 93	.963596	.90	.630656	5. 82	.369344	52
9	.594547	4. 92	.963542	.90	.631005	5. 83	.368995	51
10	.594842	4. 92	.963488	.90	.631355	5. 82	.368645	50
11	9. 595137	4. 92	9. 963434	.92	9. 631704	5. 82	10. 368296	49
12	.595432	4. 92	.963379	.90	.632053	5. 82	.367947	48
13	.595727	4. 90	.963325	.90	.632402	5. 80	.367598	47
14	.596021	4. 90	.963271	.90	.632750	5. 82	.367250	46
15	.596315	4. 90	.963217	.90	.633099	5. 80	.366901	45
16	.596609	4. 90	.963163	.92	.633447	5. 80	.366553	44
17	.596903	4. 88	.963108	.90	.633795	5. 80	.366205	43
18	.597196	4. 90	.963054	.92	.634143	5. 78	.365857	42
19	.597490	4. 88	.962999	.90	.634490	5. 80	.365510	41
20	.597783	4. 87	.962945	.92	.634838	5. 78	.365162	40
21	9. 598075	4. 88	9. 962890	.90	9. 635185	5. 78	10. 364815	39
22	.598368	4. 87	.962836	.92	.635532	5. 78	.364468	38
23	.598660	4. 87	.962781	.90	.635879	5. 78	.364121	37
24	.598952	4. 87	.962727	.92	.636226	5. 77	.363774	36
25	.599244	4. 87	.962672	.92	.636572	5. 78	.363428	35
26	.599536	4. 85	.962617	.92	.636919	5. 77	.363081	34
27	.599827	4. 85	.962562	.90	.637265	5. 77	.362735	33
28	.600118	4. 85	.962508	.92	.637611	5. 75	.362389	32
29	.600409	4. 85	.962453	.92	.637956	5. 77	.362044	31
30	.600700	4. 83	.962398	.92	.638302	5. 75	.361698	30
31	9. 600990	4. 83	9. 962343	.92	9. 638647	5. 75	10. 361353	29
32	.601280	4. 83	.962288	.92	.638992	5. 75	.361008	28
33	.601570	4. 83	.962233	.92	.639337	5. 75	.360663	27
34	.601860	4. 83	.962178	.92	.639682	5. 75	.360318	26
35	.602150	4. 82	.962123	.93	.640027	5. 73	.359973	25
36	.602439	4. 82	.962067	.92	.640371	5. 75	.359629	24
37	.602728	4. 82	.962012	.92	.640716	5. 73	.359284	23
38	.603017	4. 80	.961957	.92	.641060	5. 73	.358940	22
39	.603305	4. 82	.961902	.93	.641404	5. 72	.358596	21
40	.603594	4. 80	.961846	.92	.641747	5. 73	.358253	20
41	9. 603882	4. 80	9. 961791	.93	9. 642091	5. 72	10. 357909	19
42	.604170	4. 78	.961735	.92	.642434	5. 72	.357566	18
43	.604457	4. 80	.961680	.93	.642777	5. 72	.357223	17
44	.604745	4. 78	.961624	.92	.643120	5. 72	.356880	16
45	.605032	4. 78	.961569	.93	.643463	5. 72	.356537	15
46	.605319	4. 78	.961513	.92	.643806	5. 70	.356194	14
47	.605606	4. 77	.961458	.93	.644148	5. 70	.355852	13
48	.605892	4. 78	.961402	.93	.644490	5. 70	.355510	12
49	.606179	4. 77	.961346	.93	.644832	5. 70	.355168	11
50	.606465	4. 77	.961290	.92	.645174	5. 70	.354826	10
51	9. 606751	4. 75	9. 961235	.93	9. 645516	5. 68	10. 354484	9
52	.607036	4. 77	.961179	.93	.645857	5. 70	.354143	8
53	.607322	4. 75	.961123	.93	.646199	5. 68	.353801	7
54	.607607	4. 75	.961067	.93	.646540	5. 68	.353460	6
55	.607892	4. 75	.961011	.93	.646881	5. 68	.353119	5
56	.608177	4. 73	.960955	.93	.647222	5. 67	.352778	4
57	.608461	4. 73	.960899	.93	.647562	5. 68	.352438	3
58	.608745	4. 73	.960843	.95	.647903	5. 67	.352097	2
59	.609029	4. 73	.960786	.93	.648243	5. 67	.351757	1
60	9. 609313		9. 960730		9. 648583		10. 351417	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 609313	4. 73	9. 960730	.93	9. 648583	5. 67	10. 351417	60
1	.609597	4. 72	.960674	.93	.648923	5. 67	.351077	59
2	.609880	4. 73	.960618	.95	.649263	5. 65	.350737	58
3	.610164	4. 72	.960561	93	.649602	5. 67	.350398	57
4	.610447	4. 70	.960505	.95	.649942	5. 65	.350058	56
5	.610729	4. 72	.960448	.93	.650281	5. 65	.349719	55
6	.611012	4. 70	.960392	.95	.650620	5. 65	.349380	54
7	.611294	4. 70	.960335	.93	.650959	5. 63	.349041	53
8	.611576	4. 70	.960279	.95	.651297	5. 65	.348703	52
9	.611858	4. 70	.960222	.95	.651636	5. 63	.348364	51
10	.612140	4. 68	.960165	.93	.651974	5. 63	.348026	50
11	9. 612421	4. 68	9. 960109	.95	9. 652312	5. 63	10. 347688	49
12	.612702	4. 68	.960052	.95	.652650	5. 63	.347350	48
13	.612983	4. 68	.959995	.95	.652988	5. 63	.347012	47
14	.613264	4. 68	.959938	.93	.653326	5. 62	.346674	46
15	.613545	4. 67	.959882	.95	.653663	5. 62	.346337	45
16	.613825	4. 67	.959825	.95	.654000	5. 62	.346000	44
17	.614105	4. 67	.959768	.95	.654337	5. 62	.345663	43
18	.614385	4. 67	.959711	.95	.654674	5. 62	.345326	42
19	.614665	4. 65	.959654	.97	.655011	5. 62	.344989	41
20	.614944	4. 65	.959596	.95	.655348	5. 60	.344652	40
21	9. 615223	4. 65	9. 959539	.95	9. 655684	5. 60	10. 344316	39
22	.615502	4. 65	.959482	.95	.656020	5. 60	.343980	38
23	.615781	4. 65	.959425	.95	.656356	5. 60	.343644	37
24	.616060	4. 63	.959368	.97	.656692	5. 60	.343308	36
25	.616338	4. 63	.959310	.95	.657028	5. 60	.342972	35
26	.616616	4. 63	.959253	.97	.657364	5. 58	.342636	34
27	.616894	4. 63	.959195	.95	.657699	5. 58	.342301	33
28	.617172	4. 63	.959138	.97	.658034	5. 58	.341966	32
29	.617450	4. 62	.959080	.95	.658369	5. 58	.341631	31
30	.617727	4. 62	.959023	.97	.658704	5. 58	.341296	30
31	9. 618004	4. 62	9. 958965	.95	9. 659039	5. 57	10. 340961	29
32	.618281	4. 62	.958908	.97	.659373	5. 58	.340627	28
33	.618558	4. 60	.958850	.97	.659708	5. 57	.340292	27
34	.618834	4. 60	.958792	.97	.660042	5. 57	.339958	26
35	.619110	4. 60	.958734	.95	.660376	5. 57	.339624	25
36	.619386	4. 60	.958677	.97	.660710	5. 55	.339290	24
37	.619662	4. 60	.958619	.97	.661043	5. 57	.338957	23
38	.619938	4. 58	.958561	.97	.661377	5. 55	.338623	22
39	.620213	4. 58	.958503	.97	.661710	5. 55	.338290	21
40	.620488	4. 58	.958445	.97	.662043	5. 55	.337957	20
41	9. 620763	4. 58	9. 958387	.97	9. 662376	5. 55	10. 337624	19
42	.621038	4. 58	.958329	.97	.662709	5. 55	.337291	18
43	.621313	4. 57	.958271	.97	.663042	5. 55	.336958	17
44	.621587	4. 57	.958213	.98	.663375	5. 53	.336625	16
45	.621861	4. 57	.958154	.97	.663707	5. 53	.336293	15
46	.622135	4. 57	.958096	.97	.664039	5. 53	.335961	14
47	.622409	4. 55	.958038	.98	.664371	5. 53	.335629	13
48	.622682	4. 57	.957979	.97	.664703	5. 53	.335297	12
49	.622956	4. 55	.957921	.97	.665035	5. 52	.334965	11
50	.623229	4. 55	.957863	.98	.665366	5. 53	.334634	10
51	9. 623502	4. 53	9. 957804	.97	9. 665698	5. 52	10. 334302	9
52	.623774	4. 55	.957746	.98	.666029	5. 52	.333971	8
53	.624047	4. 53	.957687	.98	.666360	5. 52	.333640	7
54	.624319	4. 53	.957628	.97	.666691	5. 50	.333309	6
55	.624591	4. 53	.957570	.98	.667021	5. 52	.332979	5
56	.624863	4. 53	.957511	.98	.667352	5. 50	.332648	4
57	.625135	4. 52	.957452	.98	.667682	5. 52	.332318	3
58	.625406	4. 52	.957393	.97	.668013	5. 50	.331987	2
59	.625677	4. 52	.957335	.98	.668343	5. 50	.331657	1
60	9. 625948		9. 957276		9. 668673		10. 331327	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 625948		9. 957276		9. 668673		10. 331327	60
1	.626219	4.52	.957217	.98	.669002	5.48	.330998	59
2	.626490	4.52	.957158	.98	.669332	5.50	.330668	58
3	.626760	4.50	.957099	.98	.669661	5.48	.330339	57
4	.627030	4.50	.957040	.98	.669991	5.50	.330009	56
5	.627300	4.50	.956981	.98	.670320	5.48	.329680	55
6	.627570	4.50	.956921	1.00	.670649	5.48	.329351	54
7	.627840	4.50	.956862	.98	.670977	5.47	.329023	53
8	.628109	4.48	.956803	.98	.671306	5.48	.328694	52
9	.628378	4.48	.956744	.98	.671635	5.48	.328365	51
10	.628647	4.48	.956684	1.00	.671963	5.47	.328037	50
		4.48		.98		5.47		
11	9. 628916		9. 956625		9. 672291		10. 327709	49
12	.629185	4.48	.956566	.98	.672619	5.47	.327381	48
13	.629453	4.47	.956506	1.00	.672947	5.47	.327053	47
14	.629721	4.47	.956447	.98	.673274	5.45	.326726	46
15	.629989	4.47	.956387	1.00	.673602	5.47	.326398	45
16	.630257	4.47	.956327	1.00	.673929	5.45	.326071	44
17	.630524	4.45	.956268	.98	.674257	5.47	.325743	43
18	.630792	4.47	.956208	1.00	.674584	5.45	.325416	42
19	.631059	4.45	.956148	1.00	.674911	5.45	.325089	41
20	.631326	4.45	.956089	.98	.675237	5.43	.324763	40
				1.00		5.45		
21	9. 631593		9. 956029		9. 675564		10. 324436	39
22	.631859	4.43	.955969	1.00	.675890	5.43	.324110	38
23	.632125	4.43	.955909	1.00	.676217	5.45	.323783	37
24	.632392	4.45	.955849	1.00	.676543	5.43	.323457	36
25	.632658	4.43	.955789	1.00	.676869	5.43	.323131	35
26	.632923	4.42	.955729	1.00	.677194	5.42	.322806	34
27	.633189	4.43	.955669	1.00	.677520	5.43	.322480	33
28	.633454	4.42	.955609	1.00	.677846	5.43	.322154	32
29	.633719	4.42	.955548	.98	.678171	5.42	.321829	31
30	.633984	4.42	.955488	1.00	.678496	5.42	.321504	30
				1.00		5.42		
31	9. 634249		9. 955428		9. 678821		10. 321179	29
32	.634514	4.42	.955368	1.00	.679146	5.42	.320854	28
33	.634778	4.40	.955307	1.02	.679471	5.42	.320529	27
34	.635042	4.40	.955247	1.00	.679795	5.40	.320205	26
35	.635306	4.40	.955186	1.02	.680120	5.42	.319880	25
36	.635570	4.40	.955126	1.00	.680444	5.40	.319556	24
37	.635834	4.40	.955065	1.02	.680768	5.40	.319232	23
38	.636097	4.38	.955005	1.00	.681092	5.40	.318908	22
39	.636360	4.38	.954944	1.02	.681416	5.40	.318584	21
40	.636623	4.38	.954883	1.02	.681740	5.38	.318260	20
				1.00				
41	9. 636886		9. 954823		9. 682063		10. 317937	19
42	.637148	4.37	.954762	1.02	.682387	5.40	.317613	18
43	.637411	4.38	.954701	1.02	.682710	5.38	.317290	17
44	.637673	4.37	.954640	1.02	.683033	5.38	.316967	16
45	.637935	4.37	.954579	1.02	.683356	5.38	.316644	15
46	.638197	4.37	.954518	1.02	.683679	5.38	.316321	14
47	.638458	4.35	.954457	1.02	.684001	5.37	.315999	13
48	.638720	4.37	.954396	1.02	.684324	5.38	.315676	12
49	.638981	4.35	.954335	1.02	.684646	5.37	.315354	11
50	.639242	4.35	.954274	1.02	.684968	5.37	.315032	10
		4.35		1.02		5.37		
51	9. 639503		9. 954213		9. 685290		10. 314710	9
52	.639764	4.35	.954152	1.02	.685612	5.37	.314388	8
53	.640024	4.33	.954090	1.03	.685934	5.37	.314066	7
54	.640284	4.33	.954029	1.02	.686255	5.35	.313745	6
55	.640544	4.33	.953968	1.02	.686577	5.37	.313423	5
56	.640804	4.33	.953906	1.03	.686898	5.35	.313102	4
57	.641064	4.33	.953845	1.02	.687219	5.35	.312781	3
58	.641324	4.33	.953783	1.03	.687540	5.35	.312460	2
59	.641583	4.32	.953722	1.02	.687861	5.35	.312139	1
60	9. 641842	4.32	9. 953660	1.03	9. 688182		10. 311818	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.641842	4.32	9.953660	1.02	9.688182	5.33	10.311818	60
1	.642101	4.32	.953599	1.03	.688502	5.32	.311498	59
2	.642360	4.30	.953537	1.03	.688823	5.33	.311177	58
3	.642618	4.32	.953475	1.03	.689143	5.33	.310857	57
4	.642877	4.30	.953413	1.02	.689463	5.33	.310537	56
5	.643135	4.30	.953352	1.03	.689783	5.33	.310217	55
6	.643393	4.28	.953290	1.03	.690103	5.33	.309897	54
7	.643650	4.30	.953228	1.03	.690423	5.32	.309577	53
8	.643908	4.28	.953166	1.03	.690742	5.33	.309258	52
9	.644165	4.30	.953104	1.03	.691062	5.32	.308938	51
10	.644423	4.28	.953042	1.03	.691381	5.32	.308619	50
11	9.644680	4.27	9.952980	1.03	9.691700	5.32	10.308300	49
12	.644936	4.28	.952918	1.05	.692019	5.32	.307981	48
13	.645193	4.28	.952855	1.03	.692338	5.30	.307662	47
14	.645450	4.27	.952793	1.03	.692656	5.32	.307344	46
15	.645706	4.27	.952731	1.03	.692975	5.30	.307025	45
16	.645962	4.27	.952669	1.05	.693293	5.32	.306707	44
17	.646218	4.27	.952606	1.03	.693612	5.30	.306388	43
18	.646474	4.25	.952544	1.05	.693930	5.30	.306070	42
19	.646729	4.25	.952481	1.03	.694248	5.30	.305752	41
20	.646984	4.27	.952419	1.05	.694566	5.28	.305434	40
21	9.647240	4.23	9.952356	1.03	9.694883	5.30	10.305117	39
22	.647494	4.25	.952294	1.05	.695201	5.28	.304799	38
23	.647749	4.25	.952231	1.05	.695518	5.30	.304482	37
24	.648004	4.23	.952168	1.03	.695836	5.28	.304164	36
25	.648258	4.23	.952106	1.05	.696153	5.28	.303847	35
26	.648512	4.23	.952043	1.05	.696470	5.28	.303530	34
27	.648766	4.23	.951980	1.05	.696787	5.27	.303213	33
28	.649020	4.23	.951917	1.05	.697103	5.28	.302897	32
29	.649274	4.22	.951854	1.05	.697420	5.27	.302580	31
30	.649527	4.23	.951791	1.05	.697736	5.28	.302264	30
31	9.649781	4.22	9.951728	1.05	9.698053	5.27	10.301947	29
32	.650034	4.22	.951665	1.05	.698369	5.27	.301631	28
33	.650287	4.20	.951602	1.05	.698685	5.27	.301315	27
34	.650539	4.22	.951539	1.05	.699001	5.25	.300999	26
35	.650792	4.20	.951476	1.07	.699316	5.27	.300684	25
36	.651044	4.22	.951412	1.05	.699632	5.25	.300368	24
37	.651297	4.20	.951349	1.05	.699947	5.27	.300053	23
38	.651549	4.18	.951286	1.07	.700263	5.25	.299737	22
39	.651800	4.20	.951222	1.05	.700578	5.25	.299422	21
40	.652052	4.20	.951159	1.05	.700893	5.25	.299107	20
41	9.652304	4.18	9.951096	1.07	9.701208	5.25	10.298792	19
42	.652555	4.18	.951032	1.07	.701523	5.23	.298477	18
43	.652806	4.18	.950968	1.05	.701837	5.25	.298163	17
44	.653057	4.18	.950905	1.07	.702152	5.23	.297848	16
45	.653308	4.17	.950841	1.05	.702466	5.25	.297534	15
46	.653558	4.17	.950778	1.07	.702781	5.23	.297219	14
47	.653808	4.18	.950714	1.07	.703095	5.23	.296905	13
48	.654059	4.17	.950650	1.07	.703409	5.22	.296591	12
49	.654309	4.15	.950586	1.07	.703722	5.23	.296278	11
50	.654558	4.17	.950522	1.07	.704036	5.23	.295964	10
51	9.654808	4.17	9.950458	1.07	9.704350	5.22	10.295650	9
52	.655058	4.15	.950394	1.07	.704663	5.22	.295337	8
53	.655307	4.15	.950330	1.07	.704976	5.23	.295024	7
54	.655556	4.15	.950266	1.07	.705290	5.22	.294710	6
55	.655805	4.15	.950202	1.07	.705603	5.22	.294397	5
56	.656054	4.13	.950138	1.07	.705916	5.20	.294084	4
57	.656302	4.15	.950074	1.07	.706228	5.22	.293772	3
58	.656551	4.13	.950010	1.08	.706541	5.22	.293459	2
59	.656799	4.13	.949945	1.07	.706854	5.20	.293146	1
60	9.657047		9.949881		9.707166		10.292834	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 657047		9. 949881		9. 707166		10. 292834	60
1	.657295	4.13	.949816	1.08	.707478	5.20	.292522	59
2	.657542	4.12	.949752	1.07	.707790	5.20	.292210	58
3	.657790	4.13	.949688	1.07	.708102	5.20	.291898	57
4	.658037	4.12	.949623	1.08	.708414	5.20	.291586	56
5	.658284	4.12	.949558	1.08	.708726	5.20	.291274	55
6	.658531	4.12	.949494	1.07	.709037	5.18	.290963	54
7	.658778	4.12	.949429	1.08	.709349	5.20	.290651	53
8	.659025	4.10	.949364	1.08	.709660	5.18	.290340	52
9	.659271	4.10	.949300	1.07	.709971	5.18	.290029	51
10	.659517	4.10	.949235	1.08	.710282	5.18	.289718	50
11	9. 659763		9. 949170	1.08	9. 710593		10. 289407	49
12	.660009	4.10	.949105	1.08	.710904	5.18	.289096	48
13	.660255	4.10	.949040	1.08	.711215	5.18	.288785	47
14	.660501	4.10	.948975	1.08	.711525	5.17	.288475	46
15	.660746	4.08	.948910	1.08	.711836	5.18	.288164	45
16	.660991	4.08	.948845	1.08	.712146	5.17	.287854	44
17	.661236	4.08	.948780	1.08	.712456	5.17	.287544	43
18	.661481	4.08	.948715	1.08	.712766	5.17	.287234	42
19	.661726	4.07	.948650	1.10	.713076	5.17	.286924	41
20	.661970	4.07	.948584	1.08	.713386	5.17	.286614	40
21	9. 662214	4.08	9. 948519	1.08	9. 713696	5.15	10. 286304	39
22	.662459	4.07	.948454	1.10	.714005	5.15	.285995	38
23	.662703	4.05	.948388	1.08	.714314	5.17	.285686	37
24	.662946	4.07	.948323	1.10	.714624	5.15	.285376	36
25	.663190	4.05	.948257	1.08	.714933	5.15	.285067	35
26	.663433	4.07	.948192	1.10	.715242	5.15	.284758	34
27	.663677	4.05	.948126	1.10	.715551	5.15	.284449	33
28	.663920	4.05	.948060	1.08	.715860	5.13	.284140	32
29	.664163	4.05	.947995	1.10	.716168	5.15	.283832	31
30	.664406	4.03	.947929	1.10	.716477	5.13	.283523	30
31	9. 664648	4.05	9. 947863	1.10	9. 716785	5.13	10. 283215	29
32	.664891	4.03	.947797	1.10	.717093	5.13	.282907	28
33	.665133	4.03	.947731	1.10	.717401	5.13	.282599	27
34	.665375	4.03	.947665	1.08	.717709	5.13	.282291	26
35	.665617	4.03	.947600	1.12	.718017	5.13	.281983	25
36	.665859	4.02	.947533	1.10	.718325	5.13	.281675	24
37	.666100	4.03	.947467	1.10	.718633	5.12	.281367	23
38	.666342	4.02	.947401	1.10	.718940	5.13	.281060	22
39	.666583	4.02	.947335	1.10	.719248	5.12	.280752	21
40	.666824	4.02	.947269	1.10	.719555	5.12	.280445	20
41	9. 667065	4.00	9. 947203	1.12	9. 719862	5.12	10. 280138	19
42	.667305	4.02	.947136	1.10	.720169	5.12	.279831	18
43	.667546	4.00	.947070	1.10	.720476	5.12	.279524	17
44	.667786	4.02	.947004	1.12	.720783	5.10	.279217	16
45	.668027	4.00	.946937	1.10	.721089	5.12	.278911	15
46	.668267	3.98	.946871	1.12	.721396	5.10	.278604	14
47	.668506	4.00	.946804	1.10	.721702	5.12	.278298	13
48	.668746	4.00	.946738	1.12	.722009	5.10	.277991	12
49	.668986	3.98	.946671	1.12	.722315	5.10	.277685	11
50	.669225	3.98	.946604	1.10	.722621	5.10	.277379	10
51	9. 669464	3.98	9. 946538	1.12	9. 722927	5.08	10. 277073	9
52	.669703	3.98	.946471	1.12	.723232	5.10	.276768	8
53	.669942	3.98	.946404	1.12	.723538	5.10	.276462	7
54	.670181	3.97	.946337	1.12	.723844	5.08	.276156	6
55	.670419	3.98	.946270	1.12	.724149	5.08	.275851	5
56	.670658	3.97	.946203	1.12	.724454	5.10	.275546	4
57	.670896	3.97	.946136	1.12	.724760	5.08	.275240	3
58	.671134	3.97	.946069	1.12	.725065	5.08	.274935	2
59	.671372	3.95	.946002	1.12	.725370	5.07	.274630	1
60	9. 671609		9. 945935		9. 725674		10. 274326	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 671609	3. 97	9. 945935	1. 12	9. 725674	5. 08	10. 274326	60
1	. 671847	3. 95	. 945868	1. 13	. 725979	5. 08	. 274021	59
2	. 672084	3. 95	. 945800	1. 12	. 726284	5. 07	. 273716	58
3	. 672321	3. 95	. 945733	1. 12	. 726588	5. 07	. 273412	57
4	. 672558	3. 95	. 945666	1. 13	. 726892	5. 05	. 273108	56
5	. 672795	3. 95	. 945598	1. 12	. 727197	5. 07	. 272803	55
6	. 673032	3. 93	. 945531	1. 12	. 727501	5. 07	. 272499	54
7	. 673268	3. 95	. 945464	1. 13	. 727805	5. 07	. 272195	53
8	. 673505	3. 93	. 945396	1. 13	. 728109	5. 05	. 271891	52
9	. 673741	3. 93	. 945328	1. 12	. 728412	5. 07	. 271588	51
10	. 673977	3. 93	. 945261	1. 13	. 728716	5. 07	. 271284	50
11	9. 674213	3. 92	9. 945193	1. 13	9. 729020	5. 05	10. 270980	49
12	. 674448	3. 93	. 945125	1. 12	. 729323	5. 05	. 270677	48
13	. 674684	3. 92	. 945058	1. 13	. 729626	5. 05	. 270374	47
14	. 674919	3. 93	. 944990	1. 13	. 729929	5. 07	. 270071	46
15	. 675155	3. 92	. 944922	1. 13	. 730233	5. 03	. 269767	45
16	. 675390	3. 90	. 944854	1. 13	. 730535	5. 05	. 269465	44
17	. 675624	3. 92	. 944786	1. 13	. 730838	5. 05	. 269162	43
18	. 675859	3. 92	. 944718	1. 13	. 731141	5. 05	. 268859	42
19	. 676094	3. 90	. 944650	1. 13	. 731444	5. 03	. 268556	41
20	. 676328	3. 90	. 944582	1. 13	. 731746	5. 03	. 268254	40
21	9. 676562	3. 90	9. 944514	1. 13	9. 732048	5. 05	10. 267952	39
22	. 676796	3. 90	. 944446	1. 15	. 732351	5. 03	. 267649	38
23	. 677030	3. 90	. 944377	1. 13	. 732653	5. 03	. 267347	37
24	. 677264	3. 90	. 944309	1. 13	. 732955	5. 03	. 267045	36
25	. 677498	3. 88	. 944241	1. 15	. 733257	5. 02	. 266743	35
26	. 677731	3. 88	. 944172	1. 13	. 733558	5. 03	. 266442	34
27	. 677964	3. 88	. 944104	1. 13	. 733860	5. 03	. 266140	33
28	. 678197	3. 88	. 944036	1. 13	. 734162	5. 02	. 265838	32
29	. 678430	3. 88	. 943967	1. 13	. 734463	5. 02	. 265537	31
30	. 678663	3. 87	. 943899	1. 15	. 734764	5. 03	. 265236	30
31	9. 678895	3. 88	9. 943830	1. 15	9. 735066	5. 02	10. 264934	29
32	. 679128	3. 87	. 943761	1. 13	. 735367	5. 02	. 264633	28
33	. 679360	3. 87	. 943693	1. 15	. 735668	5. 02	. 264332	27
34	. 679592	3. 87	. 943624	1. 15	. 735969	5. 00	. 264031	26
35	. 679824	3. 87	. 943555	1. 15	. 736269	5. 02	. 263731	25
36	. 680056	3. 87	. 943486	1. 15	. 736570	5. 00	. 263430	24
37	. 680288	3. 85	. 943417	1. 15	. 736870	5. 02	. 263130	23
38	. 680519	3. 85	. 943348	1. 15	. 737171	5. 00	. 262829	22
39	. 680750	3. 87	. 943279	1. 15	. 737471	5. 00	. 262529	21
40	. 680982	3. 85	. 943210	1. 15	. 737771	5. 00	. 262229	20
41	9. 681213	3. 83	9. 943141	1. 15	9. 738071	5. 00	10. 261929	19
42	. 681443	3. 85	. 943072	1. 15	. 738371	5. 00	. 261629	18
43	. 681674	3. 85	. 943003	1. 15	. 738671	5. 00	. 261329	17
44	. 681905	3. 83	. 942934	1. 17	. 738971	5. 00	. 261029	16
45	. 682135	3. 83	. 942864	1. 15	. 739271	5. 00	. 260729	15
46	. 682365	3. 83	. 942795	1. 15	. 739570	4. 98	. 260430	14
47	. 682595	3. 83	. 942726	1. 17	. 739870	5. 00	. 260130	13
48	. 682825	3. 83	. 942656	1. 15	. 740169	4. 98	. 259831	12
49	. 683055	3. 82	. 942587	1. 17	. 740468	4. 98	. 259532	11
50	. 683284	3. 83	. 942517	1. 15	. 740767	4. 98	. 259233	10
51	9. 683514	3. 82	9. 942448	1. 17	9. 741066	4. 98	10. 258934	9
52	. 683743	3. 82	. 942378	1. 17	. 741365	4. 98	. 258635	8
53	. 683972	3. 82	. 942308	1. 15	. 741664	4. 97	. 258336	7
54	. 684201	3. 82	. 942239	1. 17	. 741962	4. 98	. 258038	6
55	. 684430	3. 80	. 942169	1. 17	. 742261	4. 97	. 257739	5
56	. 684658	3. 82	. 942099	1. 17	. 742559	4. 98	. 257441	4
57	. 684887	3. 80	. 942029	1. 17	. 742858	4. 97	. 257142	3
58	. 685115	3. 80	. 941959	1. 17	. 743156	4. 97	. 256844	2
59	. 685343	3. 80	. 941889	1. 17	. 743454	4. 97	. 256546	1
60	9. 685571		9. 941819		9. 743752		10. 256248	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.685571		9.941819		9.743752		10.256248	60
1	.685799	3.80	.941749	1.17	.744050	4.97	.255950	59
2	.686027	3.80	.941679	1.17	.744348	4.97	.255652	58
3	.686254	3.78	.941609	1.17	.744645	4.95	.255355	57
4	.686482	3.80	.941539	1.17	.744943	4.97	.255057	56
5	.686709	3.78	.941469	1.17	.745240	4.95	.254760	55
6	.686936	3.78	.941398	1.18	.745538	4.97	.254462	54
7	.687163	3.78	.941328	1.17	.745835	4.95	.254165	53
8	.687389	3.77	.941258	1.17	.746132	4.95	.253868	52
9	.687616	3.78	.941187	1.18	.746429	4.95	.253571	51
10	.687843	3.78	.941117	1.17	.746726	4.95	.253274	50
		3.77		1.18				
11	9.688069		9.941046		9.747023		10.252977	49
12	.688295	3.77	.940975	1.18	.747319	4.93	.252681	48
13	.688521	3.77	.940905	1.17	.747616	4.95	.252384	47
14	.688747	3.77	.940834	1.18	.747913	4.95	.252087	46
15	.688972	3.75	.940763	1.18	.748209	4.93	.251791	45
16	.689198	3.77	.940693	1.17	.748505	4.93	.251495	44
17	.689423	3.75	.940622	1.18	.748801	4.93	.251199	43
18	.689648	3.75	.940551	1.18	.749097	4.93	.250903	42
19	.689873	3.75	.940480	1.18	.749393	4.93	.250607	41
20	.690098	3.75	.940409	1.18	.749689	4.93	.250311	40
21	9.690323		9.940338		9.749985		10.250015	39
22	.690548	3.75	.940267	1.18	.750281	4.93	.249719	38
23	.690772	3.73	.940196	1.18	.750576	4.92	.249424	37
24	.690996	3.73	.940125	1.18	.750872	4.93	.249128	36
25	.691220	3.73	.940054	1.18	.751167	4.92	.248833	35
26	.691444	3.73	.939982	1.20	.751462	4.92	.248538	34
27	.691668	3.73	.939911	1.18	.751757	4.92	.248243	33
28	.691892	3.73	.939840	1.18	.752052	4.92	.247948	32
29	.692115	3.72	.939768	1.20	.752347	4.92	.247653	31
30	.692339	3.73	.939697	1.18	.752642	4.92	.247358	30
		3.72		1.20				
31	9.692562		9.939625		9.752937		10.247063	29
32	.692785	3.72	.939554	1.18	.753231	4.90	.246769	28
33	.693008	3.72	.939482	1.20	.753526	4.92	.246474	27
34	.693231	3.72	.939410	1.20	.753820	4.90	.246180	26
35	.693453	3.70	.939339	1.18	.754115	4.92	.245885	25
36	.693676	3.72	.939267	1.20	.754409	4.90	.245591	24
37	.693898	3.70	.939195	1.20	.754703	4.90	.245297	23
38	.694120	3.70	.939123	1.18	.754997	4.90	.245003	22
39	.694342	3.70	.939052	1.20	.755291	4.90	.244709	21
40	.694564	3.70	.938980	1.20	.755585	4.88	.244415	20
		3.68		1.20				
41	9.694786		9.938908		9.755878	4.90	10.244122	19
42	.695007	3.70	.938836	1.22	.756172	4.88	.243828	18
43	.695229	3.68	.938763	1.20	.756465	4.90	.243535	17
44	.695450	3.68	.938691	1.20	.756759	4.88	.243241	16
45	.695671	3.68	.938619	1.20	.757052	4.88	.242948	15
46	.695892	3.68	.938547	1.20	.757345	4.88	.242655	14
47	.696113	3.68	.938475	1.22	.757638	4.88	.242362	13
48	.696334	3.67	.938402	1.20	.757931	4.88	.242069	12
49	.696554	3.68	.938330	1.20	.758224	4.88	.241776	11
50	.696775	3.67	.938258	1.22	.758517	4.88	.241483	10
		3.67		1.20				
51	9.696995		9.938185		9.758810	4.87	10.241190	9
52	.697215	3.67	.938113	1.22	.759102	4.88	.240898	8
53	.697435	3.65	.938040	1.22	.759395	4.87	.240605	7
54	.697654	3.67	.937967	1.20	.759687	4.87	.240313	6
55	.697874	3.67	.937895	1.22	.759979	4.88	.240021	5
56	.698094	3.65	.937822	1.22	.760272	4.87	.239728	4
57	.698313	3.65	.937749	1.22	.760564	4.87	.239436	3
58	.698532	3.65	.937676	1.20	.760856	4.87	.239144	2
59	.698751	3.65	.937604	1.22	.761148	4.85	.238852	1
60	9.698970		9.937531		9.761439		10.238561	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.698970	3.65	9.937531	1.22	9.761439	4.87	10.238561	60
1	.699189	3.63	.937458	1.22	.761731	4.87	.238269	59
2	.699407	3.65	.937385	1.22	.762023	4.85	.237977	58
3	.699626	3.63	.937312	1.23	.762314	4.87	.237686	57
4	.699844	3.63	.937238	1.22	.762606	4.85	.237394	56
5	.700062	3.63	.937165	1.22	.762897	4.85	.237103	55
6	.700280	3.63	.937092	1.22	.763188	4.85	.236812	54
7	.700498	3.63	.937019	1.22	.763479	4.85	.236521	53
8	.700716	3.62	.936946	1.23	.763770	4.85	.236230	52
9	.700933	3.63	.936872	1.22	.764061	4.85	.235939	51
10	.701151	3.62	.936799	1.23	.764352	4.85	.235648	50
11	9.701368	3.62	9.936725	1.22	9.764643	4.83	10.235357	49
12	.701585	3.62	.936652	1.23	.764933	4.85	.235067	48
13	.701802	3.62	.936578	1.22	.765224	4.83	.234776	47
14	.702019	3.62	.936505	1.23	.765514	4.85	.234486	46
15	.702236	3.60	.936431	1.23	.765805	4.83	.234195	45
16	.702452	3.62	.936357	1.22	.766095	4.83	.233905	44
17	.702669	3.60	.936284	1.23	.766385	4.83	.233615	43
18	.702885	3.60	.936210	1.23	.766675	4.83	.233325	42
19	.703101	3.60	.936136	1.23	.766965	4.83	.233035	41
20	.703317	3.60	.936062	1.23	.767255	4.83	.232745	40
21	9.703533	3.60	9.935988	1.23	9.767545	4.82	10.232455	39
22	.703749	3.58	.935914	1.23	.767834	4.83	.232166	38
23	.703964	3.58	.935840	1.23	.768124	4.83	.231876	37
24	.704179	3.60	.935766	1.23	.768414	4.82	.231586	36
25	.704395	3.58	.935692	1.23	.768703	4.82	.231297	35
26	.704610	3.58	.935618	1.25	.768992	4.82	.231008	34
27	.704825	3.58	.935543	1.23	.769281	4.83	.230719	33
28	.705040	3.58	.935469	1.23	.769571	4.82	.230429	32
29	.705254	3.57	.935395	1.23	.769860	4.80	.230140	31
30	.705469	3.58	.935320	1.25	.770148	4.82	.229852	30
31	9.705683	3.57	9.935246	1.23	9.770437	4.82	10.229563	29
32	.705898	3.58	.935171	1.25	.770726	4.82	.229274	28
33	.706112	3.57	.935097	1.23	.771015	4.80	.228985	27
34	.706326	3.57	.935022	1.25	.771303	4.82	.228697	26
35	.706539	3.55	.934948	1.23	.771592	4.80	.228408	25
36	.706753	3.57	.934873	1.25	.771880	4.80	.228120	24
37	.706967	3.57	.934798	1.25	.772168	4.82	.227832	23
38	.707180	3.55	.934723	1.25	.772457	4.80	.227543	22
39	.707393	3.55	.934649	1.23	.772745	4.80	.227255	21
40	.707606	3.55	.934574	1.25	.773033	4.80	.226967	20
41	9.707819	3.55	9.934499	1.25	9.773321	4.78	10.226679	19
42	.708032	3.55	.934424	1.25	.773608	4.80	.226392	18
43	.708245	3.55	.934349	1.25	.773896	4.80	.226104	17
44	.708458	3.53	.934274	1.25	.774184	4.78	.225816	16
45	.708670	3.53	.934199	1.27	.774471	4.80	.225529	15
46	.708882	3.53	.934123	1.25	.774759	4.78	.225241	14
47	.709094	3.53	.934048	1.25	.775046	4.78	.224954	13
48	.709306	3.53	.933973	1.25	.775333	4.80	.224667	12
49	.709518	3.53	.933898	1.27	.775621	4.78	.224379	11
50	.709730	3.52	.933822	1.25	.775908	4.78	.224092	10
51	9.709941	3.53	9.933747	1.27	9.776195	4.78	10.223805	9
52	.710153	3.52	.933671	1.25	.776482	4.77	.223518	8
53	.710364	3.52	.933596	1.27	.776768	4.78	.223232	7
54	.710575	3.52	.933520	1.25	.777055	4.78	.222945	6
55	.710786	3.52	.933445	1.27	.777342	4.77	.222658	5
56	.710997	3.52	.933369	1.27	.777628	4.78	.222372	4
57	.711208	3.52	.933293	1.27	.777915	4.77	.222085	3
58	.711419	3.50	.933217	1.27	.778201	4.78	.221799	2
59	.711629	3.50	.933141	1.25	.778488	4.77	.221512	1
60	9.711839		9.933066		9.778774		10.221226	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.711839	3.52	9.933066	1.27	9.778774	4.77	10.221226	60
1	.712050	3.50	.932990	1.27	.779060	4.77	.220940	59
2	.712260	3.48	.932914	1.27	.779346	4.77	.220654	58
3	.712469	3.50	.932838	1.27	.779632	4.77	.220368	57
4	.712679	3.50	.932762	1.28	.779918	4.75	.220082	56
5	.712889	3.48	.932685	1.27	.780203	4.77	.219797	55
6	.713098	3.50	.932609	1.27	.780489	4.77	.219511	54
7	.713308	3.48	.932533	1.27	.780775	4.75	.219225	53
8	.713517	3.48	.932457	1.28	.781060	4.77	.218940	52
9	.713726	3.48	.932380	1.27	.781346	4.75	.218654	51
10	.713935	3.48	.932304	1.27	.781631	4.75	.218369	50
11	9.714144	3.47	9.932228	1.28	9.781916	4.75	10.218084	49
12	.714352	3.48	.932151	1.27	.782201	4.75	.217799	48
13	.714561	3.47	.932075	1.28	.782486	4.75	.217514	47
14	.714769	3.48	.931998	1.28	.782771	4.75	.217229	46
15	.714978	3.47	.931921	1.27	.783056	4.75	.216944	45
16	.715186	3.47	.931845	1.28	.783341	4.75	.216659	44
17	.715394	3.47	.931768	1.28	.783626	4.73	.216374	43
18	.715602	3.45	.931691	1.28	.783910	4.75	.216090	42
19	.715809	3.47	.931614	1.28	.784195	4.73	.215805	41
20	.716017	3.45	.931537	1.28	.784479	4.75	.215521	40
21	9.716224	3.47	9.931460	1.28	9.784764	4.73	10.215236	39
22	.716432	3.45	.931383	1.28	.785048	4.73	.214952	38
23	.716639	3.45	.931306	1.28	.785332	4.73	.214668	37
24	.716846	3.45	.931229	1.28	.785616	4.73	.214384	36
25	.717053	3.43	.931152	1.28	.785900	4.73	.214100	35
26	.717259	3.45	.931075	1.28	.786184	4.73	.213816	34
27	.717466	3.45	.930998	1.28	.786468	4.73	.213532	33
28	.717673	3.43	.930921	1.30	.786752	4.73	.213248	32
29	.717879	3.43	.930843	1.28	.787036	4.72	.212964	31
30	.718085	3.43	.930766	1.30	.787319	4.73	.212681	30
31	9.718291	3.43	9.930688	1.28	9.787603	4.72	10.212397	29
32	.718497	3.43	.930611	1.30	.787886	4.73	.212114	28
33	.718703	3.43	.930533	1.28	.788170	4.72	.211830	27
34	.718909	3.42	.930456	1.30	.788453	4.72	.211547	26
35	.719114	3.43	.930378	1.30	.788736	4.72	.211264	25
36	.719320	3.42	.930300	1.28	.789019	4.72	.210981	24
37	.719525	3.42	.930223	1.30	.789302	4.72	.210698	23
38	.719730	3.42	.930145	1.30	.789585	4.72	.210415	22
39	.719935	3.42	.930067	1.30	.789868	4.72	.210132	21
40	.720140	3.42	.929989	1.30	.790151	4.72	.209849	20
41	9.720345	3.40	9.929911	1.30	9.790434	4.70	10.209566	19
42	.720549	3.42	.929833	1.30	.790716	4.72	.209284	18
43	.720754	3.40	.929755	1.30	.790999	4.70	.209001	17
44	.720958	3.40	.929677	1.30	.791281	4.70	.208719	16
45	.721162	3.40	.929599	1.30	.791563	4.72	.208437	15
46	.721366	3.40	.929521	1.32	.791846	4.70	.208154	14
47	.721570	3.40	.929442	1.30	.792128	4.70	.207872	13
48	.721774	3.40	.929364	1.30	.792410	4.70	.207590	12
49	.721978	3.38	.929286	1.32	.792692	4.70	.207308	11
50	.722181	3.40	.929207	1.30	.792974	4.70	.207026	10
51	9.722385	3.38	9.929129	1.32	9.793256	4.70	10.206744	9
52	.722588	3.38	.929050	1.30	.793538	4.68	.206462	8
53	.722791	3.38	.928972	1.32	.793819	4.70	.206181	7
54	.722994	3.38	.928893	1.30	.794101	4.70	.205899	6
55	.723197	3.38	.928815	1.32	.794383	4.68	.205617	5
56	.723400	3.38	.928736	1.32	.794664	4.70	.205336	4
57	.723603	3.37	.928657	1.32	.794946	4.68	.205054	3
58	.723805	3.37	.928578	1.32	.795227	4.68	.204773	2
59	.724007	3.38	.928499	1.32	.795508	4.68	.204492	1
60	9.724210		9.928420		9.795789		10.204211	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 724210	3. 37	9. 928420	1. 30	9. 795789	4. 68	10. 204211	60
1	.724412	3. 37	.928342	1. 32	.796070	4. 68	.203930	59
2	.724614	3. 37	.928263	1. 33	.796351	4. 68	.203649	58
3	.724816	3. 35	.928183	1. 32	.796632	4. 68	.203368	57
4	.725017	3. 37	.928104	1. 32	.796913	4. 68	.203087	56
5	.725219	3. 35	.928025	1. 32	.797194	4. 67	.202806	55
6	.725420	3. 37	.927946	1. 32	.797474	4. 68	.202526	54
7	.725622	3. 35	.927867	1. 33	.797755	4. 68	.202245	53
8	.725823	3. 35	.927787	1. 32	.798036	4. 67	.201964	52
9	.726024	3. 35	.927708	1. 32	.798316	4. 67	.201684	51
10	.726225	3. 35	.927629	1. 33	.798596	4. 68	.201404	50
11	9. 726426	3. 33	9. 927549	1. 32	9. 798877	4. 67	10. 201123	49
12	.726626	3. 35	.927470	1. 33	.799157	4. 67	.200843	48
13	.726827	3. 33	.927390	1. 33	.799437	4. 67	.200563	47
14	.727027	3. 35	.927310	1. 32	.799717	4. 67	.200283	46
15	.727228	3. 33	.927231	1. 33	.799997	4. 67	.200003	45
16	.727428	3. 33	.927151	1. 33	.800277	4. 67	.199723	44
17	.727628	3. 33	.927071	1. 33	.800557	4. 65	.199443	43
18	.727828	3. 32	.926991	1. 33	.800836	4. 67	.199164	42
19	.728027	3. 33	.926911	1. 33	.801116	4. 67	.198884	41
20	.728227	3. 33	.926831	1. 33	.801396	4. 65	.198604	40
21	9. 728427	3. 32	9. 926751	1. 33	9. 801675	4. 67	10. 198325	39
22	.728626	3. 32	.926671	1. 33	.801955	4. 65	.198045	38
23	.728825	3. 32	.926591	1. 33	.802234	4. 65	.197766	37
24	.729024	3. 32	.926511	1. 33	.802513	4. 65	.197487	36
25	.729223	3. 32	.926431	1. 33	.802792	4. 67	.197208	35
26	.729422	3. 32	.926351	1. 35	.803072	4. 65	.196928	34
27	.729621	3. 32	.926270	1. 33	.803351	4. 65	.196649	33
28	.729820	3. 30	.926190	1. 33	.803630	4. 65	.196370	32
29	.730018	3. 32	.926110	1. 35	.803909	4. 63	.196091	31
30	.730217	3. 30	.926029	1. 33	.804187	4. 65	.195813	30
31	9. 730415	3. 30	9. 925949	1. 35	9. 804466	4. 65	10. 195534	29
32	.730613	3. 30	.925868	1. 33	.804745	4. 63	.195255	28
33	.730811	3. 30	.925788	1. 35	.805023	4. 65	.194977	27
34	.731009	3. 28	.925707	1. 35	.805302	4. 63	.194698	26
35	.731206	3. 30	.925626	1. 35	.805580	4. 65	.194420	25
36	.731404	3. 30	.925545	1. 33	.805859	4. 63	.194141	24
37	.731602	3. 28	.925465	1. 35	.806137	4. 63	.193863	23
38	.731799	3. 28	.925384	1. 35	.806415	4. 63	.193585	22
39	.731996	3. 28	.925303	1. 35	.806693	4. 63	.193307	21
40	.732193	3. 28	.925222	1. 35	.806971	4. 63	.193029	20
41	9. 732390	3. 28	9. 925141	1. 35	9. 807249	4. 63	10. 192751	19
42	.732587	3. 28	.925060	1. 35	.807527	4. 63	.192473	18
43	.732784	3. 27	.924979	1. 37	.807805	4. 63	.192195	17
44	.732980	3. 28	.924897	1. 35	.808083	4. 63	.191917	16
45	.733177	3. 27	.924816	1. 35	.808361	4. 62	.191639	15
46	.733373	3. 27	.924735	1. 35	.808638	4. 63	.191362	14
47	.733569	3. 27	.924654	1. 37	.808916	4. 62	.191084	13
48	.733765	3. 27	.924572	1. 35	.809193	4. 63	.190807	12
49	.733961	3. 27	.924491	1. 37	.809471	4. 62	.190529	11
50	.734157	3. 27	.924409	1. 35	.809748	4. 62	.190252	10
51	9. 734353	3. 27	9. 924328	1. 37	9. 810025	4. 62	10. 189975	9
52	.734549	3. 25	.924246	1. 37	.810302	4. 63	.189698	8
53	.734744	3. 25	.924164	1. 35	.810580	4. 62	.189420	7
54	.734939	3. 27	.924083	1. 37	.810857	4. 62	.189143	6
55	.735135	3. 25	.924001	1. 37	.811134	4. 60	.188866	5
56	.735330	3. 25	.923919	1. 37	.811410	4. 62	.188590	4
57	.735525	3. 23	.923837	1. 37	.811687	4. 62	.188313	3
58	.735719	3. 25	.923755	1. 37	.811964	4. 62	.188036	2
59	.735914	3. 25	.923673	1. 37	.812241	4. 60	.187759	1
60	9. 736109		9. 923591		9. 812517		10. 187483	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.736109		9.923591		9.812517		10.187483	60
1	.736303	3.23	.923509	1.37	.812794	4.62	.187206	59
2	.736498	3.25	.923427	1.37	.813070	4.60	.186930	58
3	.736692	3.23	.923345	1.37	.813347	4.62	.186653	57
4	.736886	3.23	.923263	1.37	.813623	4.60	.186377	56
5	.737080	3.23	.923181	1.38	.813899	4.60	.186101	55
6	.737274	3.23	.923098	1.37	.814176	4.62	.185824	54
7	.737467	3.22	.923016	1.38	.814452	4.60	.185548	53
8	.737661	3.23	.922933	1.37	.814728	4.60	.185272	52
9	.737855	3.23	.922851	1.38	.815004	4.60	.184996	51
10	.738048	3.22	.922768	1.37	.815280	4.58	.184720	50
11	9.738241		9.922686		9.815555		10.184445	49
12	.738434	3.22	.922603	1.38	.815831	4.60	.184169	48
13	.738627	3.22	.922520	1.38	.816107	4.60	.183893	47
14	.738820	3.22	.922438	1.37	.816382	4.58	.183618	46
15	.739013	3.22	.922355	1.38	.816658	4.60	.183342	45
16	.739206	3.22	.922272	1.38	.816933	4.58	.183067	44
17	.739398	3.20	.922189	1.38	.817209	4.60	.182791	43
18	.739590	3.20	.922106	1.38	.817484	4.58	.182516	42
19	.739783	3.22	.922023	1.38	.817759	4.58	.182241	41
20	.739975	3.20	.921940	1.38	.818035	4.60	.181965	40
21	9.740167		9.921857		9.818310		10.181690	39
22	.740359	3.20	.921774	1.38	.818585	4.58	.181415	38
23	.740550	3.18	.921691	1.38	.818860	4.58	.181140	37
24	.740742	3.20	.921607	1.40	.819135	4.58	.180865	36
25	.740934	3.20	.921524	1.38	.819410	4.58	.180590	35
26	.741125	3.18	.921441	1.38	.819684	4.57	.180316	34
27	.741316	3.18	.921357	1.40	.819959	4.58	.180041	33
28	.741508	3.20	.921274	1.38	.820234	4.58	.179766	32
29	.741699	3.18	.921190	1.40	.820508	4.57	.179492	31
30	.741889	3.17	.921107	1.38	.820783	4.58	.179217	30
31	9.742080	3.18	9.921023	1.40	9.821057	4.57	10.178943	29
32	.742271	3.18	.920939	1.38	.821332	4.57	.178668	28
33	.742462	3.17	.920856	1.40	.821606	4.57	.178394	27
34	.742652	3.17	.920772	1.40	.821880	4.57	.178120	26
35	.742842	3.18	.920688	1.40	.822154	4.58	.177846	25
36	.743033	3.17	.920604	1.40	.822429	4.57	.177571	24
37	.743223	3.17	.920520	1.40	.822703	4.57	.177297	23
38	.743413	3.15	.920436	1.40	.822977	4.57	.177023	22
39	.743602	3.17	.920352	1.40	.823251	4.55	.176749	21
40	.743792	3.17	.920268	1.40	.823524	4.57	.176476	20
41	9.743982	3.15	9.920184	1.42	9.823798	4.57	10.176202	19
42	.744171	3.17	.920099	1.40	.824072	4.55	.175928	18
43	.744361	3.15	.920015	1.40	.824345	4.57	.175655	17
44	.744550	3.15	.919931	1.42	.824619	4.57	.175381	16
45	.744739	3.15	.919846	1.40	.824893	4.55	.175107	15
46	.744928	3.15	.919762	1.42	.825166	4.55	.174834	14
47	.745117	3.15	.919677	1.40	.825439	4.57	.174561	13
48	.745306	3.13	.919593	1.42	.825713	4.55	.174287	12
49	.745494	3.15	.919508	1.40	.825986	4.55	.174014	11
50	.745683	3.13	.919424	1.42	.826259	4.55	.173741	10
51	9.745871	3.15	9.919339	1.42	9.826532	4.55	10.173468	9
52	.746060	3.13	.919254	1.42	.826805	4.55	.173195	8
53	.746248	3.13	.919169	1.40	.827078	4.55	.172922	7
54	.746436	3.13	.919085	1.42	.827351	4.55	.172649	6
55	.746624	3.13	.919000	1.42	.827624	4.55	.172376	5
56	.746812	3.12	.918915	1.42	.827897	4.55	.172103	4
57	.746999	3.13	.918830	1.42	.828170	4.53	.171830	3
58	.747187	3.12	.918745	1.43	.828442	4.55	.171558	2
59	.747374	3.13	.918659	1.42	.828715	4.53	.171285	1
60	9.747562		9.918574		9.828987		10.171013	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 747562		9. 918574		9. 828987		10. 171013	60
1	.747749	3. 12	.918489	1. 42	.829260	4. 55	.170740	59
2	.747936	3. 12	.918404	1. 42	.829532	4. 53	.170468	58
3	.748123	3. 12	.918318	1. 43	.829805	4. 55	.170195	57
4	.748310	3. 12	.918233	1. 42	.830077	4. 53	.169923	56
5	.748497	3. 12	.918147	1. 43	.830349	4. 53	.169651	55
6	.748683	3. 10	.918062	1. 42	.830621	4. 53	.169379	54
7	.748870	3. 12	.917976	1. 43	.830893	4. 53	.169107	53
8	.749056	3. 10	.917891	1. 42	.831165	4. 53	.168835	52
9	.749243	3. 12	.917805	1. 43	.831437	4. 53	.168563	51
10	.749429	3. 10	.917719	1. 42	.831709	4. 53	.168291	50
11	9. 749615	3. 10	9. 917634	1. 43	9. 831981	4. 53	10. 168019	49
12	.749801	3. 10	.917548	1. 43	.832253	4. 53	.167747	48
13	.749987	3. 08	.917462	1. 43	.832525	4. 52	.167475	47
14	.750172	3. 10	.917376	1. 43	.832796	4. 53	.167204	46
15	.750358	3. 08	.917290	1. 43	.833068	4. 52	.166932	45
16	.750543	3. 10	.917204	1. 43	.833339	4. 53	.166661	44
17	.750729	3. 08	.917118	1. 43	.833611	4. 52	.166389	43
18	.750914	3. 08	.917032	1. 43	.833882	4. 52	.166118	42
19	.751099	3. 08	.916946	1. 45	.834154	4. 53	.165846	41
20	.751284	3. 08	.916859	1. 43	.834425	4. 52	.165575	40
21	9. 751469	3. 08	9. 916773	1. 43	9. 834696	4. 52	10. 165304	39
22	.751654	3. 08	.916687	1. 45	.834967	4. 52	.165033	38
23	.751839	3. 07	.916600	1. 43	.835238	4. 52	.164762	37
24	.752023	3. 08	.916514	1. 45	.835509	4. 52	.164491	36
25	.752208	3. 07	.916427	1. 43	.835780	4. 52	.164220	35
26	.752392	3. 07	.916341	1. 45	.836051	4. 52	.163949	34
27	.752576	3. 07	.916254	1. 45	.836322	4. 52	.163678	33
28	.752760	3. 07	.916167	1. 43	.836593	4. 52	.163407	32
29	.752944	3. 07	.916081	1. 45	.836864	4. 50	.163136	31
30	.753128	3. 07	.915994	1. 45	.837134	4. 52	.162866	30
31	9. 753312	3. 05	9. 915907	1. 45	9. 837405	4. 50	10. 162595	29
32	.753495	3. 07	.915820	1. 45	.837675	4. 52	.162325	28
33	.753679	3. 07	.915733	1. 45	.837946	4. 50	.162054	27
34	.753862	3. 07	.915646	1. 45	.838216	4. 52	.161784	26
35	.754046	3. 05	.915559	1. 45	.838487	4. 50	.161513	25
36	.754229	3. 05	.915472	1. 45	.838757	4. 50	.161243	24
37	.754412	3. 05	.915385	1. 47	.839027	4. 50	.160973	23
38	.754595	3. 05	.915297	1. 45	.839297	4. 52	.160703	22
39	.754778	3. 03	.915210	1. 45	.839568	4. 50	.160432	21
40	.754960	3. 05	.915123	1. 47	.839838	4. 50	.160162	20
41	9. 755143	3. 05	9. 915035	1. 45	9. 840108	4. 50	10. 159892	19
42	.755326	3. 03	.914948	1. 47	.840378	4. 50	.159622	18
43	.755508	3. 03	.914860	1. 45	.840648	4. 48	.159352	17
44	.755690	3. 03	.914773	1. 47	.840917	4. 50	.159083	16
45	.755872	3. 03	.914685	1. 45	.841187	4. 50	.158813	15
46	.756054	3. 03	.914598	1. 47	.841457	4. 50	.158543	14
47	.756236	3. 03	.914510	1. 47	.841727	4. 48	.158273	13
48	.756418	3. 03	.914422	1. 47	.841996	4. 50	.158004	12
49	.756600	3. 03	.914334	1. 47	.842266	4. 48	.157734	11
50	.756782	3. 02	.914246	1. 47	.842535	4. 50	.157465	10
51	9. 756963	3. 02	9. 914158	1. 47	9. 842805	4. 48	10. 157195	9
52	.757144	3. 03	.914070	1. 47	.843074	4. 48	.156926	8
53	.757326	3. 02	.913982	1. 47	.843343	4. 48	.156657	7
54	.757507	3. 02	.913894	1. 47	.843612	4. 50	.156388	6
55	.757688	3. 02	.913806	1. 47	.843882	4. 48	.156118	5
56	.757869	3. 02	.913718	1. 47	.844151	4. 48	.155849	4
57	.758050	3. 00	.913630	1. 48	.844420	4. 48	.155580	3
58	.758230	3. 02	.913541	1. 47	.844689	4. 48	.155311	2
59	.758411	3. 00	.913453	1. 47	.844958	4. 48	.155042	1
60	9. 758591		9. 913365		9. 845227		10. 154773	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.758591	3.02	9.913365	1.48	9.845227	4.48	10.154773	60
1	.758772	3.00	.913276	1.48	.845496	4.47	.154504	59
2	.758952	3.00	.913187	1.47	.845764	4.48	.154236	58
3	.759132	3.00	.913099	1.48	.846033	4.48	.153967	57
4	.759312	3.00	.913010	1.47	.846302	4.47	.153698	56
5	.759492	3.00	.912922	1.48	.846570	4.48	.153430	55
6	.759672	3.00	.912833	1.48	.846839	4.48	.153161	54
7	.759852	2.98	.912744	1.48	.847108	4.47	.152892	53
8	.760031	3.00	.912655	1.48	.847376	4.47	.152624	52
9	.760211	2.98	.912566	1.48	.847644	4.48	.152356	51
10	.760390	2.98	.912477	1.48	.847913	4.47	.152087	50
11	9.760569	2.98	9.912388	1.48	9.848181	4.47	10.151819	49
12	.760748	2.98	.912299	1.48	.848449	4.47	.151551	48
13	.760927	2.98	.912210	1.48	.848717	4.48	.151283	47
14	.761106	2.98	.912121	1.50	.848986	4.47	.151014	46
15	.761285	2.98	.912031	1.48	.849254	4.47	.150746	45
16	.761464	2.97	.911942	1.48	.849522	4.47	.150478	44
17	.761642	2.98	.911853	1.50	.849790	4.45	.150210	43
18	.761821	2.97	.911763	1.48	.850057	4.47	.149943	42
19	.761999	2.97	.911674	1.50	.850325	4.47	.149675	41
20	.762177	2.98	.911584	1.48	.850593	4.47	.149407	40
21	9.762356	2.97	9.911495	1.50	9.850861	4.47	10.149139	39
22	.762534	2.97	.911405	1.50	.851129	4.45	.148871	38
23	.762712	2.95	.911315	1.48	.851396	4.47	.148604	37
24	.762889	2.97	.911226	1.50	.851664	4.45	.148336	36
25	.763067	2.97	.911136	1.50	.851931	4.47	.148069	35
26	.763245	2.95	.911046	1.50	.852199	4.45	.147801	34
27	.763422	2.97	.910956	1.50	.852466	4.45	.147534	33
28	.763600	2.95	.910866	1.50	.852733	4.47	.147267	32
29	.763777	2.95	.910776	1.50	.853001	4.45	.146999	31
30	.763954	2.95	.910686	1.50	.853268	4.45	.146732	30
31	9.764131	2.95	9.910596	1.50	9.853535	4.45	10.146465	29
32	.764308	2.95	.910506	1.52	.853802	4.45	.146198	28
33	.764485	2.95	.910415	1.50	.854069	4.45	.145931	27
34	.764662	2.93	.910325	1.50	.854336	4.45	.145664	26
35	.764838	2.95	.910235	1.52	.854603	4.45	.145397	25
36	.765015	2.93	.910144	1.50	.854870	4.45	.145130	24
37	.765191	2.93	.910054	1.52	.855137	4.45	.144863	23
38	.765367	2.95	.909963	1.50	.855404	4.45	.144596	22
39	.765544	2.93	.909873	1.52	.855671	4.45	.144329	21
40	.765720	2.93	.909782	1.52	.855938	4.43	.144062	20
41	9.765896	2.93	9.909691	1.50	9.856204	4.45	10.143796	19
42	.766072	2.92	.909601	1.52	.856471	4.43	.143529	18
43	.766247	2.93	.909510	1.52	.856737	4.45	.143263	17
44	.766423	2.92	.909419	1.52	.857004	4.43	.142996	16
45	.766598	2.93	.909328	1.52	.857270	4.45	.142730	15
46	.766774	2.92	.909237	1.52	.857537	4.43	.142463	14
47	.766949	2.92	.909146	1.52	.857803	4.43	.142197	13
48	.767124	2.93	.909055	1.52	.858069	4.45	.141931	12
49	.767300	2.92	.908964	1.52	.858336	4.43	.141664	11
50	.767475	2.90	.908873	1.53	.858602	4.43	.141398	10
51	9.767649	2.92	9.908781	1.52	9.858868	4.43	10.141132	9
52	.767824	2.92	.908690	1.52	.859134	4.43	.140866	8
53	.767999	2.90	.908599	1.53	.859400	4.43	.140600	7
54	.768173	2.92	.908507	1.52	.859666	4.43	.140334	6
55	.768348	2.90	.908416	1.53	.859932	4.43	.140068	5
56	.768522	2.92	.908324	1.52	.860198	4.43	.139802	4
57	.768697	2.90	.908233	1.53	.860464	4.43	.139536	3
58	.768871	2.90	.908141	1.53	.860730	4.42	.139270	2
59	.769045	2.90	.908049	1.52	.860995	4.43	.139005	1
60	9.769219		9.907958		9.861261		10.138739	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 769219	2. 90	9. 907958	1. 53	9. 861261	4. 43	10. 138739	60
1	.769393	2. 88	.907866	1. 53	.861527	4. 42	.138473	59
2	.769566	2. 90	.907774	1. 53	.861792	4. 43	.138208	58
3	.769740	2. 88	.907682	1. 53	.862058	4. 42	.137942	57
4	.769913	2. 90	.907590	1. 53	.862323	4. 43	.137677	56
5	.770087	2. 88	.907498	1. 53	.862589	4. 42	.137411	55
6	.770260	2. 88	.907406	1. 53	.862854	4. 42	.137146	54
7	.770433	2. 88	.907314	1. 53	.863119	4. 43	.136881	53
8	.770606	2. 88	.907222	1. 55	.863385	4. 42	.136615	52
9	.770779	2. 88	.907129	1. 53	.863650	4. 42	.136350	51
10	.770952	2. 88	.907037	1. 53	.863915	4. 42	.136085	50
11	9. 771125	2. 88	9. 906945	1. 55	9. 864180	4. 42	10. 135820	49
12	.771298	2. 87	.906852	1. 53	.864445	4. 42	.135555	48
13	.771470	2. 88	.906760	1. 55	.864710	4. 42	.135290	47
14	.771643	2. 87	.906667	1. 53	.864975	4. 42	.135025	46
15	.771815	2. 87	.906575	1. 55	.865240	4. 42	.134760	45
16	.771987	2. 87	.906482	1. 55	.865505	4. 42	.134495	44
17	.772159	2. 87	.906389	1. 55	.865770	4. 42	.134230	43
18	.772331	2. 87	.906296	1. 53	.866035	4. 42	.133965	42
19	.772503	2. 87	.906204	1. 55	.866300	4. 40	.133700	41
20	.772675	2. 87	.906111	1. 55	.866564	4. 42	.133436	40
21	9. 772847	2. 85	9. 906018	1. 55	9. 866829	4. 42	10. 133171	39
22	.773018	2. 87	.905925	1. 55	.867094	4. 40	.132906	38
23	.773190	2. 85	.905832	1. 55	.867358	4. 42	.132642	37
24	.773361	2. 87	.905739	1. 57	.867623	4. 40	.132377	36
25	.773533	2. 85	.905645	1. 55	.867887	4. 42	.132113	35
26	.773704	2. 85	.905552	1. 55	.868152	4. 40	.131848	34
27	.773875	2. 85	.905459	1. 55	.868416	4. 40	.131584	33
28	.774046	2. 85	.905366	1. 57	.868680	4. 42	.131320	32
29	.774217	2. 85	.905272	1. 55	.868945	4. 40	.131055	31
30	.774388	2. 83	.905179	1. 57	.869209	4. 40	.130791	30
31	9. 774558	2. 85	9. 905085	1. 55	9. 869473	4. 40	10. 130527	29
32	.774729	2. 83	.904992	1. 57	.869737	4. 40	.130263	28
33	.774899	2. 85	.904898	1. 57	.870001	4. 40	.129999	27
34	.775070	2. 83	.904804	1. 55	.870265	4. 40	.129735	26
35	.775240	2. 83	.904711	1. 57	.870529	4. 40	.129471	25
36	.775410	2. 83	.904617	1. 57	.870793	4. 40	.129207	24
37	.775580	2. 83	.904523	1. 57	.871057	4. 40	.128943	23
38	.775750	2. 83	.904429	1. 57	.871321	4. 40	.128679	22
39	.775920	2. 83	.904335	1. 57	.871585	4. 40	.128415	21
40	.776090	2. 82	.904241	1. 57	.871849	4. 38	.128151	20
41	9. 776259	2. 83	9. 904147	1. 57	9. 872112	4. 40	10. 127888	19
42	.776429	2. 82	.904053	1. 57	.872376	4. 40	.127624	18
43	.776598	2. 83	.903959	1. 58	.872640	4. 38	.127360	17
44	.776768	2. 82	.903864	1. 57	.872903	4. 40	.127097	16
45	.776937	2. 82	.903770	1. 57	.873167	4. 38	.126833	15
46	.777106	2. 82	.903676	1. 58	.873430	4. 40	.126570	14
47	.777275	2. 82	.903581	1. 57	.873694	4. 38	.126306	13
48	.777444	2. 82	.903487	1. 58	.873957	4. 38	.126043	12
49	.777613	2. 80	.903392	1. 57	.874220	4. 40	.125780	11
50	.777781	2. 82	.903298	1. 58	.874484	4. 38	.125516	10
51	9. 777950	2. 82	9. 903203	1. 58	9. 874747	4. 38	10. 125253	9
52	.778119	2. 80	.903108	1. 57	.875010	4. 38	.124990	8
53	.778287	2. 80	.903014	1. 58	.875273	4. 40	.124727	7
54	.778455	2. 82	.902919	1. 58	.875537	4. 38	.124463	6
55	.778624	2. 80	.902824	1. 58	.875800	4. 38	.124200	5
56	.778792	2. 80	.902729	1. 58	.876063	4. 38	.123937	4
57	.778960	2. 80	.902634	1. 58	.876326	4. 38	.123674	3
58	.779128	2. 78	.902539	1. 58	.876589	4. 38	.123411	2
59	.779295	2. 80	.902444	1. 58	.876852	4. 37	.123148	1
60	9. 779463		9. 902349		9. 877114		10. 122886	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.779463		9.902349		9.877114		10.122886	60
1	.779631	2.80	.902253	1.60	.877377	4.38	.122623	59
2	.779798	2.78	.902158	1.58	.877640	4.38	.122360	58
3	.779966	2.80	.902063	1.58	.877903	4.38	.122097	57
4	.780133	2.78	.901967	1.60	.878165	4.37	.121835	56
5	.780300	2.78	.901872	1.58	.878428	4.38	.121572	55
6	.780467	2.78	.901776	1.60	.878691	4.38	.121309	54
7	.780634	2.78	.901681	1.58	.878953	4.37	.121047	53
8	.780801	2.78	.901585	1.60	.879216	4.38	.120784	52
9	.780968	2.77	.901490	1.58	.879478	4.37	.120522	51
10	.781134	2.78	.901394	1.60	.879741	4.38	.120259	50
11	9.781301		9.901298		9.880003	4.37	10.119997	49
12	.781468	2.78	.901202	1.60	.880265	4.37	.119735	48
13	.781634	2.77	.901106	1.60	.880528	4.38	.119472	47
14	.781800	2.77	.901010	1.60	.880790	4.37	.119210	46
15	.781966	2.77	.900914	1.60	.881052	4.37	.118948	45
16	.782132	2.77	.900818	1.60	.881314	4.37	.118686	44
17	.782298	2.77	.900722	1.60	.881577	4.38	.118423	43
18	.782464	2.77	.900626	1.62	.881839	4.37	.118161	42
19	.782630	2.77	.900529	1.60	.882101	4.37	.117899	41
20	.782796	2.75	.900433	1.60	.882363	4.37	.117637	40
21	9.782961	2 77	9.900337	1.62	9.882625	4.37	10.117375	39
22	.783127	2.75	.900240	1.60	.882887	4.35	.117113	38
23	.783292	2.77	.900144	1.62	.883148	4.37	.116852	37
24	.783458	2.75	.900047	1.60	.883410	4.37	.116590	36
25	.783623	2.75	.899951	1.62	.883672	4.37	.116328	35
26	.783788	2.75	.899854	1.62	.883934	4.37	.116066	34
27	.783953	2.75	.899757	1.62	.884196	4.35	.115804	33
28	.784118	2.73	.899660	1.60	.884457	4.37	.115543	32
29	.784282	2.75	.899564	1.62	.884719	4.35	.115281	31
30	.784447	2.75	.899467	1.62	.884980	4.37	.115020	30
31	9.784612	2.73	9.899370	1.62	9.885242	4.37	10.114758	29
32	.784776	2.75	.899273	1.62	.885504	4.35	.114496	28
33	.784941	2.73	.899176	1.63	.885765	4.35	.114235	27
34	.785105	2.73	.899078	1.62	.886026	4.37	.113974	26
35	.785269	2.73	.898981	1.62	.886288	4.35	.113712	25
36	.785433	2.73	.898884	1.62	.886549	4.37	.113451	24
37	.785597	2.73	.898787	1.63	.886811	4.35	.113189	23
38	.785761	2.73	.898689	1.62	.887072	4.35	.112928	22
39	.785925	2.73	.898592	1.63	.887333	4.35	.112667	21
40	.786089	2.72	.898494	1.62	.887594	4.35	.112406	20
41	9.786252	2.73	9.898397	1.63	9.887855	4.35	10.112145	19
42	.786416	2.72	.898299	1.62	.888116	4.37	.111884	18
43	.786579	2.72	.898202	1.63	.888378	4.35	.111622	17
44	.786742	2.73	.898104	1.63	.888639	4.35	.111361	16
45	.786906	2.72	.898006	1.63	.888900	4.35	.111100	15
46	.787069	2.72	.897908	1.63	.889161	4.33	.110839	14
47	.787232	2.72	.897810	1.63	.889421	4.35	.110579	13
48	.787395	2.72	.897712	1.63	.889682	4.35	.110318	12
49	.787557	2.70	.897614	1.63	.889943	4.35	.110057	11
50	.787720	2.72	.897516	1.63	.890204	4.35	.109796	10
51	9.787883	2.70	9.897418	1.63	9.890465	4.33	10.109535	9
52	.788045	2.72	.897320	1.63	.890725	4.35	.109275	8
53	.788208	2.70	.897222	1.65	.890986	4.35	.109014	7
54	.788370	2.70	.897123	1.63	.891247	4.33	.108753	6
55	.788532	2.70	.897025	1.65	.891507	4.35	.108493	5
56	.788694	2.70	.896926	1.63	.891768	4.33	.108232	4
57	.788856	2.70	.896828	1.65	.892028	4.35	.107972	3
58	.789018	2.70	.896729	1.63	.892289	4.33	.107711	2
59	.789180	2.70	.896631	1.65	.892549	4.35	.107451	1
60	9.789342		9.896532		9.892810		10.107190	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 789342	2. 70	9. 896532	1. 65	9. 892810	4. 33	10. 107190	60
1	. 789504	2. 68	. 896433	1. 63	. 893070	4. 35	. 106930	59
2	. 789665	2. 70	. 896335	1. 65	. 893331	4. 33	. 106669	58
3	. 789827	2. 68	. 896236	1. 65	. 893591	4. 33	. 106409	57
4	. 789988	2. 68	. 896137	1. 65	. 893851	4. 33	. 106149	56
5	. 790149	2. 68	. 896038	1. 65	. 894111	4. 35	. 105889	55
6	. 790310	2. 68	. 895939	1. 65	. 894372	4. 33	. 105628	54
7	. 790471	2. 68	. 895840	1. 65	. 894632	4. 33	. 105368	53
8	. 790632	2. 68	. 895741	1. 67	. 894892	4. 33	. 105108	52
9	. 790793	2. 68	. 895641	1. 65	. 895152	4. 33	. 104848	51
10	. 790954	2. 68	. 895542	1. 65	. 895412	4. 33	. 104588	50
11	9. 791115	2. 67	9. 895443	1. 67	9. 895672	4. 33	10. 104328	49
12	. 791275	2. 68	. 895343	1. 65	. 895932	4. 33	. 104068	48
13	. 791436	2. 67	. 895244	1. 65	. 896192	4. 33	. 103808	47
14	. 791596	2. 68	. 895145	1. 65	. 896452	4. 33	. 103548	46
15	. 791757	2. 67	. 895045	1. 67	. 896712	4. 32	. 103288	45
16	. 791917	2. 67	. 894945	1. 67	. 896971	4. 33	. 103029	44
17	. 792077	2. 67	. 894846	1. 65	. 897231	4. 33	. 102769	43
18	. 792237	2. 67	. 894746	1. 67	. 897491	4. 33	. 102509	42
19	. 792397	2. 67	. 894646	1. 67	. 897751	4. 32	. 102249	41
20	. 792557	2. 65	. 894546	1. 67	. 898010	4. 33	. 101990	40
21	9. 792716	2. 67	9. 894446	1. 67	9. 898270	4. 33	10. 101730	39
22	. 792876	2. 65	. 894346	1. 67	. 898530	4. 32	. 101470	38
23	. 793035	2. 67	. 894246	1. 67	. 898789	4. 33	. 101211	37
24	. 793195	2. 65	. 894146	1. 67	. 899049	4. 32	. 100951	36
25	. 793354	2. 67	. 894046	1. 67	. 899308	4. 33	. 100692	35
26	. 793514	2. 65	. 893946	1. 67	. 899568	4. 32	. 100432	34
27	. 793673	2. 65	. 893846	1. 68	. 899827	4. 33	. 100173	33
28	. 793832	2. 65	. 893745	1. 67	. 900087	4. 32	. 099913	32
29	. 793991	2. 65	. 893645	1. 68	. 900346	4. 32	. 099654	31
30	. 794150	2. 63	. 893544	1. 67	. 900605	4. 32	. 099395	30
31	9. 794308	2. 65	9. 893444	1. 68	9. 900864	4. 33	10. 099136	29
32	. 794467	2. 65	. 893343	1. 67	. 901124	4. 32	. 098876	28
33	. 794626	2. 63	. 893243	1. 68	. 901383	4. 32	. 098617	27
34	. 794784	2. 63	. 893142	1. 68	. 901642	4. 32	. 098358	26
35	. 794942	2. 65	. 893041	1. 68	. 901901	4. 32	. 098099	25
36	. 795101	2. 63	. 892940	1. 68	. 902160	4. 33	. 097840	24
37	. 795259	2. 63	. 892839	1. 67	. 902420	4. 32	. 097580	23
38	. 795417	2. 63	. 892739	1. 68	. 902679	4. 32	. 097321	22
39	. 795575	2. 63	. 892638	1. 70	. 902938	4. 32	. 097062	21
40	. 795733	2. 63	. 892536	1. 68	. 903197	4. 32	. 096803	20
41	9. 795891	2. 63	9. 892435	1. 68	9. 903456	4. 30	10. 096544	19
42	. 796049	2. 62	. 892334	1. 68	. 903714	4. 32	. 096286	18
43	. 796206	2. 63	. 892233	1. 68	. 903973	4. 32	. 096027	17
44	. 796364	2. 62	. 892132	1. 70	. 904232	4. 32	. 095768	16
45	. 796521	2. 63	. 892030	1. 68	. 904491	4. 32	. 095509	15
46	. 796679	2. 62	. 891929	1. 70	. 904750	4. 30	. 095250	14
47	. 796836	2. 62	. 891827	1. 68	. 905008	4. 32	. 094992	13
48	. 796993	2. 62	. 891726	1. 70	. 905267	4. 32	. 094733	12
49	. 797150	2. 62	. 891624	1. 68	. 905526	4. 32	. 094474	11
50	. 797307	2. 62	. 891523	1. 70	. 905785	4. 30	. 094215	10
51	9. 797464	2. 62	9. 891421	1. 70	9. 906043	4. 32	10. 093957	9
52	. 797621	2. 60	. 891319	1. 70	. 906302	4. 30	. 093698	8
53	. 797777	2. 62	. 891217	1. 70	. 906560	4. 32	. 093440	7
54	. 797934	2. 62	. 891115	1. 70	. 906819	4. 30	. 093181	6
55	. 798091	2. 60	. 891013	1. 70	. 907077	4. 32	. 092923	5
56	. 798247	2. 60	. 890911	1. 70	. 907336	4. 30	. 092664	4
57	. 798403	2. 62	. 890809	1. 70	. 907594	4. 32	. 092406	3
58	. 798560	2. 60	. 890707	1. 70	. 907853	4. 30	. 092147	2
59	. 798716	2. 60	. 890605	1. 70	. 908111	4. 30	. 091889	1
60	9. 798872		9. 890503		9. 908369		10, 091631	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.798872		9.890503		9.908369		10.091631	60
1	.799028	2.60	.890400	1.72	.908628	4.32	.091372	59
2	.799184	2.60	.890298	1.70	.908886	4.30	.091114	58
3	.799339	2.58	.890195	1.72	.909144	4.30	.090856	57
4	.799495	2.60	.890093	1.70	.909402	4.30	.090598	56
5	.799651	2.60	.889990	1.72	.909660	4.30	.090340	55
6	.799806	2.58	.889888	1.70	.909918	4.30	.090082	54
7	.799962	2.60	.889785	1.72	.910177	4.32	.089823	53
8	.800117	2.58	.889682	1.72	.910435	4.30	.089565	52
9	.800272	2.58	.889579	1.70	.910693	4.30	.089307	51
10	.800427	2.58	.889477	1.72	.910951	4.30	.089049	50
11	9.800582	2.58	9.889374	1.72	9.911209	4.30	10.088791	49
12	.800737	2.58	.889271	1.72	.911467	4.30	.088533	48
13	.800892	2.58	.889168	1.73	.911725	4.28	.088275	47
14	.801047	2.57	.889064	1.72	.911982	4.30	.088018	46
15	.801201	2.58	.888961	1.72	.912240	4.30	.087760	45
16	.801356	2.58	.888858	1.72	.912498	4.30	.087502	44
17	.801511	2.57	.888755	1.73	.912756	4.30	.087244	43
18	.801665	2.57	.888651	1.72	.913014	4.28	.086986	42
19	.801819	2.57	.888548	1.73	.913271	4.30	.086729	41
20	.801973	2.58	.888444	1.72	.913529	4.30	.086471	40
21	9.802128	2.57	9.888341	1.73	9.913787	4.28	10.086213	39
22	.802282	2.57	.888237	1.72	.914044	4.30	.085956	38
23	.802436	2.55	.888134	1.73	.914302	4.30	.085698	37
24	.802589	2.57	.888030	1.73	.914560	4.28	.085440	36
25	.802743	2.57	.887926	1.73	.914817	4.30	.085183	35
26	.802897	2.55	.887822	1.73	.915075	4.28	.084925	34
27	.803050	2.57	.887718	1.73	.915332	4.30	.084668	33
28	.803204	2.55	.887614	1.73	.915590	4.28	.084410	32
29	.803357	2.57	.887510	1.73	.915847	4.28	.084153	31
30	.803511	2.55	.887406	1.73	.916104	4.30	.083896	30
31	9.803664	2.55	9.887302	1.73	9.916362	4.28	10.083638	29
32	.803817	2.55	.887198	1.75	.916619	4.30	.083381	28
33	.803970	2.55	.887093	1.73	.916877	4.28	.083123	27
34	.804123	2.55	.886989	1.73	.917134	4.28	.082866	26
35	.804276	2.55	.886885	1.75	.917391	4.28	.082609	25
36	.804428	2.55	.886780	1.73	.917648	4.30	.082352	24
37	.804581	2.55	.886676	1.75	.917906	4.28	.082094	23
38	.804734	2.53	.886571	1.75	.918163	4.28	.081837	22
39	.804886	2.55	.886466	1.73	.918420	4.28	.081580	21
40	.805039	2.53	.886362	1.75	.918677	4.28	.081323	20
41	9.805191	2.53	9.886257	1.75	9.918934	4.28	10.081066	19
42	.805343	2.53	.886152	1.75	.919191	4.28	.080809	18
43	.805495	2.53	.886047	1.75	.919448	4.28	.080552	17
44	.805647	2.53	.885942	1.75	.919705	4.28	.080295	16
45	.805799	2.53	.885837	1.75	.919962	4.28	.080038	15
46	.805951	2.53	.885732	1.75	.920219	4.28	.079781	14
47	.806103	2.52	.885627	1.75	.920476	4.28	.079524	13
48	.806254	2.53	.885522	1.77	.920733	4.28	.079267	12
49	.806406	2.52	.885416	1.75	.920990	4.28	.079010	11
50	.806557	2.53	.885311	1.77	.921247	4.27	.078753	10
51	9.806709	2.52	9.885205	1.75	9.921503	4.28	10.078497	9
52	.806860	2.52	.885100	1.77	.921760	4.28	.078240	8
53	.807011	2.53	.884994	1.75	.922017	4.28	.077983	7
54	.807163	2.52	.884889	1.77	.922274	4.27	.077726	6
55	.807314	2.52	.884783	1.77	.922530	4.28	.077470	5
56	.807465	2.50	.884677	1.75	.922787	4.28	.077213	4
57	.807615	2.52	.884572	1.77	.923044	4.27	.076956	3
58	.807766	2.52	.884466	1.77	.923300	4.28	.076700	2
59	.807917	2.50	.884360	1.77	.923557	4.28	.076443	1
60	9.808067		9.884254		9.923814		10.076186	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 808067	2. 52	9. 884254	1. 77	9. 923814	4. 27	10. 076186	60
1	. 808218	2. 50	884148	1. 77	. 924070	4. 28	. 075930	59
2	. 808368	2. 52	. 884042	1. 77	. 924327	4. 27	. 075673	58
3	. 808519	2. 50	. 883936	1. 78	. 924583	4. 28	. 075417	57
4	. 808669	2. 50	. 883829	1. 77	. 924840	4. 27	. 075160	56
5	. 808819	2. 50	. 883723	1. 77	. 925096	4. 27	. 074904	55
6	. 808969	2. 50	. 883617	1. 78	. 925352	4. 28	. 074648	54
7	. 809119	2. 50	. 883510	1. 77	. 925609	4. 27	. 074391	53
8	. 809269	2. 50	. 883404	1. 78	. 925865	4. 28	. 074135	52
9	. 809419	2. 50	. 883297	1. 77	. 926122	4. 27	. 073878	51
10	. 809569	2. 48	. 883191	1. 78	. 926378	4. 27	. 073622	50
11	9. 809718	2. 50	9. 883084	1. 78	9. 926634	4. 27	10. 073366	49
12	. 809868	2. 48	. 882977	1. 77	. 926890	4. 28	. 073110	48
13	. 810017	2. 50	. 882871	1. 78	. 927147	4. 27	. 072853	47
14	. 810167	2. 48	. 882764	1. 78	. 927403	4. 27	. 072597	46
15	. 810316	2. 48	. 882657	1. 78	. 927659	4. 27	. 072341	45
16	. 810465	2. 48	. 882550	1. 78	. 927915	4. 27	. 072085	44
17	. 810614	2. 48	. 882443	1. 78	. 928171	4. 27	. 071829	43
18	. 810763	2. 48	. 882336	1. 78	. 928427	4. 28	. 071573	42
19	. 810912	2. 48	. 882229	1. 80	. 928684	4. 27	. 071316	41
20	. 811061	2. 48	. 882121	1. 78	. 928940	4. 27	. 071060	40
21	9. 811210	2. 47	9. 882014	1. 78	9. 929196	4. 27	10. 070804	39
22	. 811358	2. 48	. 881907	1. 80	. 929452	4. 27	. 070548	38
23	. 811507	2. 47	. 881799	1. 78	. 929708	4. 27	. 070292	37
24	. 811655	2. 48	. 881692	1. 80	. 929964	4. 27	. 070036	36
25	. 811804	2. 47	. 881584	1. 78	. 930220	4. 25	. 069780	35
26	. 811952	2. 47	. 881477	1. 80	. 930475	4. 27	. 069525	34
27	. 812100	2. 47	. 881369	1. 80	. 930731	4. 27	. 069269	33
28	. 812248	2. 47	. 881261	1. 80	. 930987	4. 27	. 069013	32
29	. 812396	2. 47	. 881153	1. 78	. 931243	4. 27	. 068757	31
30	. 812544	2. 47	. 881046	1. 80	. 931499	4. 27	. 068501	30
31	9. 812692	2. 47	9. 880938	1. 80	9. 931755	4. 25	10. 068245	29
32	. 812840	2. 47	. 880830	1. 80	. 932010	4. 27	. 067990	28
33	. 812988	2. 45	. 880722	1. 82	. 932266	4. 27	. 067734	27
34	. 813135	2. 47	. 880613	1. 80	. 932522	4. 27	. 067478	26
35	. 813283	2. 45	. 880505	1. 80	. 932778	4. 25	. 067222	25
36	. 813430	2. 47	. 880397	1. 80	. 933033	4. 27	. 066967	24
37	. 813578	2. 45	. 880289	1. 82	. 933289	4. 27	. 066711	23
38	. 813725	2. 45	. 880180	1. 80	. 933545	4. 25	. 066455	22
39	. 813872	2. 45	. 880072	1. 82	. 933800	4. 27	. 066200	21
40	. 814019	2. 45	. 879963	1. 80	. 934056	4. 25	. 065944	20
41	9. 814166	2. 45	9. 879855	1. 82	9. 934311	4. 27	10. 065689	19
42	. 814313	2. 45	. 879746	1. 82	. 934567	4. 25	. 065433	18
43	. 814460	2. 45	. 879637	1. 80	. 934822	4. 27	. 065178	17
44	. 814607	2. 45	. 879529	1. 82	. 935078	4. 25	. 064922	16
45	. 814753	2. 43	. 879420	1. 82	. 935333	4. 27	. 064667	15
46	. 814900	2. 45	. 879311	1. 82	. 935589	4. 25	. 064411	14
47	. 815046	2. 43	. 879202	1. 82	. 935844	4. 27	. 064156	13
48	. 815193	2. 45	. 879093	1. 82	. 936100	4. 25	. 063900	12
49	. 815339	2. 43	. 878984	1. 82	. 936355	4. 27	. 063645	11
50	. 815485	2. 43	. 878875	1. 82	. 936611	4. 25	. 063389	10
51	9. 815632	2. 43	9. 878766	1. 83	9. 936866	4. 25	10. 063134	9
52	. 815778	2. 43	. 878656	1. 82	. 937121	4. 27	. 062879	8
53	. 815924	2. 42	. 878547	1. 82	. 937377	4. 25	. 062623	7
54	. 816069	2. 43	. 878438	1. 83	. 937632	4. 25	. 062368	6
55	. 816215	2. 43	. 878328	1. 82	. 937887	4. 25	. 062113	5
56	. 816361	2. 43	. 878219	1. 83	. 938142	4. 27	. 061858	4
57	. 816507	2. 42	. 878109	1. 83	. 938398	4. 25	. 061602	3
58	. 816652	2. 43	. 877999	1. 82	. 938653	4. 25	. 061347	2
59	. 816798	2. 42	. 877890	1. 83	. 938908	4. 25	. 061092	1
60	9. 816943		9. 877780		9. 939163		10. 060837	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.816943	2.42	9.877780	1.83	9.939163	4.25	10.060837	60
1	.817088	2.42	.877670	1.83	.939418	4.25	.060582	59
2	.817233	2.43	.877560	1.83	.939673	4.25	.060327	58
3	.817379	2.42	.877450	1.83	.939928	4.25	.060072	57
4	.817524	2.40	.877340	1.83	.940183	4.27	.059817	56
5	.817668	2.42	.877230	1.83	.940439	4.25	.059561	55
6	.817813	2.42	.877120	1.83	.940694	4.25	.059306	54
7	.817958	2.42	.877010	1.85	.940949	4.25	.059051	53
8	.818103	2.40	.876899	1.83	.941204	4.25	.058796	52
9	.818247	2.42	.876789	1.85	.941459	4.23	.058541	51
10	.818392	2.40	.876678	1.83	.941713	4.25	.058287	50
11	9.818536	2.42	9.876568	1.85	9.941968	4.25	10.058032	49
12	.818681	2.40	.876457	1.83	.942223	4.25	.057777	48
13	.818825	2.40	.876347	1.85	.942478	4.25	.057522	47
14	.818969	2.40	.876236	1.85	.942733	4.25	.057267	46
15	.819113	2.40	.876125	1.85	.942988	4.25	.057012	45
16	.819257	2.40	.876014	1.83	.943243	4.25	.056757	44
17	.819401	2.40	.875904	1.85	.943498	4.23	.056502	43
18	.819545	2.40	.875793	1.85	.943752	4.25	.056248	42
19	.819689	2.38	.875682	1.85	.944007	4.25	.055993	41
20	.819832	2.40	.875571	1.87	.944262	4.25	.055738	40
21	9.819976	2.40	9.875459	1.85	9.944517	4.23	10.055483	39
22	.820120	2.38	.875348	1.85	.944771	4.25	.055229	38
23	.820263	2.38	.875237	1.85	.945026	4.25	.054974	37
24	.820406	2.40	.875126	1.87	.945281	4.23	.054719	36
25	.820550	2.38	.875014	1.85	.945535	4.25	.054465	35
26	.820693	2.38	.874903	1.87	.945790	4.25	.054210	34
27	.820836	2.38	.874791	1.85	.946045	4.23	.053955	33
28	.820979	2.38	.874680	1.87	.946299	4.25	.053701	32
29	.821122	2.38	.874568	1.87	.946554	4.23	.053446	31
30	.821265	2.37	.874456	1.87	.946808	4.25	.053192	30
31	9.821407	2.38	9.874344	1.87	9.947063	4.25	10.052937	29
32	.821550	2.38	.874232	1.85	.947318	4.23	.052682	28
33	.821693	2.37	.874121	1.87	.947572	4.25	.052428	27
34	.821835	2.37	.874009	1.88	.947827	4.23	.052173	26
35	.821977	2.38	.873896	1.87	.948081	4.23	.051919	25
36	.822120	2.37	.873784	1.87	.948335	4.25	.051665	24
37	.822262	2.37	.873672	1.87	.948590	4.23	.051410	23
38	.822404	2.37	.873560	1.87	.948844	4.25	.051156	22
39	.822546	2.37	.873448	1.88	.949099	4.23	.050901	21
40	.822688	2.37	.873335	1.87	.949353	4.25	.050647	20
41	9.822830	2.37	9.873223	1.88	9.949608	4.23	10.050392	19
42	.822972	2.37	.873110	1.87	.949862	4.23	.050138	18
43	.823114	2.35	.872998	1.88	.950116	4.25	.049884	17
44	.823255	2.37	.872885	1.88	.950371	4.23	.049629	16
45	.823397	2.37	.872772	1.88	.950625	4.23	.049375	15
46	.823539	2.35	.872659	1.87	.950879	4.23	.049121	14
47	.823680	2.35	.872547	1.88	.951133	4.25	.048867	13
48	.823821	2.37	.872434	1.88	.951388	4.23	.048612	12
49	.823963	2.35	.872321	1.88	.951642	4.23	.048358	11
50	.824104	2.35	.872208	1.88	.951896	4.23	.048104	10
51	9.824245	2.35	9.872095	1.90	9.952150	4.25	10.047850	9
52	.824386	2.35	.871981	1.88	.952405	4.23	.047595	8
53	.824527	2.35	.871868	1.88	.952659	4.23	.047341	7
54	.824668	2.33	.871755	1.90	.952913	4.23	.047087	6
55	.824808	2.35	.871641	1.88	.953167	4.23	.046833	5
56	.824949	2.35	.871528	1.90	.953421	4.23	.046579	4
57	.825090	2.33	.871414	1.88	.953675	4.23	.046325	3
58	.825230	2.35	.871301	1.90	.953929	4.23	.046071	2
59	.825371	2.33	.871187	1.90	.954183	4.23	.045817	1
60	9.825511		9.871073		9.954437		10.045563	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 825511	2. 33	9. 871073	1. 88	9. 954437	4. 23	10. 045563	60
1	.825651	2. 33	.870960	1. 90	.954691	4. 25	.045309	59
2	.825791	2. 33	.870846	1. 90	.954946	4. 23	.045054	58
3	.825931	2. 33	.870732	1. 90	.955200	4. 23	.044800	57
4	.826071	2. 33	.870618	1. 90	.955454	4. 23	.044546	56
5	.826211	2. 33	.870504	1. 90	.955708	4. 22	.044292	55
6	.826351	2. 33	.870390	1. 90	.955961	4. 23	.044039	54
7	.826491	2. 33	.870276	1. 92	.956215	4. 23	.043785	53
8	.826631	2. 32	.870161	1. 90	.956469	4. 23	.043531	52
9	.826770	2. 33	.870047	1. 90	.956723	4. 23	.043277	51
10	.826910	2. 32	.869933	1. 92	.956977	4. 23	.043023	50
11	9. 827049	2. 33	9. 869818	1. 90	9. 957231	4. 23	10. 042769	49
12	.827189	2. 32	.869704	1. 92	.957485	4. 23	.042515	48
13	.827328	2. 32	.869589	1. 92	.957739	4. 23	.042261	47
14	.827467	2. 32	.869474	1. 90	.957993	4. 23	.042007	46
15	.827606	2. 32	.869360	1. 92	.958247	4. 22	.041753	45
16	.827745	2. 32	.869245	1. 92	.958500	4. 23	.041500	44
17	.827884	2. 32	.869130	1. 92	.958754	4. 23	.041246	43
18	.828023	2. 32	.869015	1. 92	.959008	4. 23	.040992	42
19	.828162	2. 32	.868900	1. 92	.959262	4. 23	.040738	41
20	.828301	2. 30	.868785	1. 92	.959516	4. 22	.040484	40
21	9. 828439	2. 32	9. 868670	1. 92	9. 959769	4. 23	10. 040231	39
22	.828578	2. 30	.868555	1. 92	.960023	4. 23	.039977	38
23	.828716	2. 32	.868440	1. 93	.960277	4. 22	.039723	37
24	.828855	2. 30	.868324	1. 92	.960530	4. 23	.039470	36
25	.828993	2. 30	.868209	1. 93	.960784	4. 23	.039216	35
26	.829131	2. 30	.868093	1. 92	.961038	4. 23	.038962	34
27	.829269	2. 30	.867978	1. 93	.961292	4. 22	.038708	33
28	.829407	2. 30	.867862	1. 92	.961545	4. 23	.038455	32
29	.829545	2. 30	.867747	1. 93	.961799	4. 22	.038201	31
30	.829683	2. 30	.867631	1. 93	.962052	4. 23	.037948	30
31	9. 829821	2. 30	9. 867515	1. 93	9. 962306	4. 23	10. 037694	29
32	.829959	2. 30	.867399	1. 93	.962560	4. 22	.037440	28
33	.830097	2. 28	.867283	1. 93	.962813	4. 23	.037187	27
34	.830234	2. 30	.867167	1. 93	.963067	4. 22	.036933	26
35	.830372	2. 28	.867051	1. 93	.963320	4. 23	.036680	25
36	.830509	2. 28	.866935	1. 93	.963574	4. 23	.036426	24
37	.830646	2. 30	.866819	1. 93	.963828	4. 22	.036172	23
38	.830784	2. 28	.866703	1. 95	.964081	4. 23	.035919	22
39	.830921	2. 28	.866586	1. 93	.964335	4. 22	.035665	21
40	.831058	2. 28	.866470	1. 95	.964588	4. 23	.035412	20
41	9. 831195	2. 28	9. 866353	1. 93	9. 964842	4. 22	10. 035158	19
42	.831332	2. 28	.866237	1. 95	.965095	4. 23	.034905	18
43	.831469	2. 28	.866120	1. 93	.965349	4. 22	.034651	17
44	.831606	2. 27	.866004	1. 95	.965602	4. 22	.034398	16
45	.831742	2. 28	.865887	1. 95	.965855	4. 23	.034145	15
46	.831879	2. 27	.865770	1. 95	.966109	4. 22	.033891	14
47	.832015	2. 28	.865653	1. 95	.966362	4. 23	.033638	13
48	.832152	2. 27	.865536	1. 95	.966616	4. 22	.033384	12
49	.832288	2. 28	.865419	1. 95	.966869	4. 23	.033131	11
50	.832425	2. 27	.865302	1. 95	.967123	4. 22	.032877	10
51	9. 832561	2. 27	9. 865185	1. 95	9. 967376	4. 22	10. 032624	9
52	.832697	2. 27	.865068	1. 97	.967629	4. 23	.032371	8
53	.832833	2. 27	.864950	1. 95	.967883	4. 22	.032117	7
54	.832969	2. 27	.864833	1. 95	.968136	4. 22	.031864	6
55	.833105	2. 27	.864716	1. 97	.968389	4. 23	.031611	5
56	.833241	2. 27	.864598	1. 95	.968643	4. 22	.031357	4
57	.833377	2. 25	.864481	1. 97	.968896	4. 22	.031104	3
58	.833512	2. 27	.864363	1. 97	.969149	4. 23	.030851	2
59	.833648	2. 25	.864245	1. 97	.969403	4. 22	.030597	1
60	9. 833783		9. 864127		9. 969656		10. 030344	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9. 833783	2. 27	9. 864127	1. 95	9. 969656	4. 22	10. 030344	60
1	.833919	2. 25	.864010	1. 97	.969909	4. 22	.030091	59
2	.834054	2. 25	.863892	1. 97	.970162	4. 23	.029838	58
3	.834189	2. 25	.863774	1. 97	.970416	4. 22	.029584	57
4	.834325	2. 27	.863656	1. 97	.970669	4. 22	.029331	56
5	.834460	2. 25	.863538	1. 98	.970922	4. 22	.029078	55
6	.834595	2. 25	.863419	1. 97	.971175	4. 22	.028825	54
7	.834730	2. 25	.863301	1. 97	.971429	4. 23	.028571	53
8	.834865	2. 23	.863183	1. 98	.971682	4. 22	.028318	52
9	.834999	2. 25	.863064	1. 97	.971935	4. 22	.028065	51
10	.835134	2. 25	.862946	1. 98	.972188	4. 22	.027812	50
11	9. 835269	2. 23	9. 862827	1. 97	9. 972441	4. 23	10. 027559	49
12	.835403	2. 25	.862709	1. 98	.972695	4. 22	.027305	48
13	.835538	2. 23	.862590	1. 98	.972948	4. 22	.027052	47
14	.835672	2. 25	.862471	1. 97	.973201	4. 22	.026799	46
15	.835807	2. 23	.862353	1. 98	.973454	4. 22	.026546	45
16	.835941	2. 23	.862234	1. 98	.973707	4. 22	.026293	44
17	.836075	2. 23	.862115	1. 98	.973960	4. 22	.026040	43
18	.836209	2. 23	.861996	1. 98	.974213	4. 22	.025787	42
19	.836343	2. 23	.861877	1. 98	.974466	4. 23	.025534	41
20	.836477	2. 23	.861758	2. 00	.974720	4. 22	.025280	40
21	9. 836611	2. 23	9. 861638	1. 98	9. 974973	4. 22	10. 025027	39
22	.836745	2. 22	.861519	1. 98	.975226	4. 22	.024774	38
23	.836878	2. 23	.861400	2. 00	.975479	4. 22	.024521	37
24	.837012	2. 23	.861280	1. 98	.975732	4. 22	.024268	36
25	.837146	2. 22	.861161	2. 00	.975985	4. 22	.024015	35
26	.837279	2. 22	.861041	1. 98	.976238	4. 22	.023762	34
27	.837412	2. 23	.860922	2. 00	.976491	4. 22	.023509	33
28	.837546	2. 22	.860802	2. 00	.976744	4. 22	.023256	32
29	.837679	2. 22	.860682	2. 00	.976997	4. 22	.023003	31
30	.837812	2. 22	.860562	2. 00	.977250	4. 22	.022750	30
31	9. 837945	2. 22	9. 860442	2. 00	9. 977503	4. 22	10. 022497	29
32	.838078	2. 22	.860322	2. 00	.977756	4. 22	.022244	28
33	.838211	2. 22	.860202	2. 00	.978009	4. 22	.021991	27
34	.838344	2. 22	.860082	2. 00	.978262	4. 22	.021738	26
35	.838477	2. 22	.859962	2. 00	.978515	4. 22	.021485	25
36	.838610	2. 20	.859842	2. 02	.978768	4. 22	.021232	24
37	.838742	2. 22	.859721	2. 00	.979021	4. 22	.020979	23
38	.838875	2. 20	.859601	2. 02	.979274	4. 22	.020726	22
39	.839007	2. 22	.859480	2. 00	.979527	4. 22	.020473	21
40	.839140	2. 20	.859360	2. 02	.979780	4. 22	.020220	20
41	9. 839272	2. 20	9. 859239	2. 00	9. 980033	4. 22	10. 019967	19
42	.839404	2. 20	.859119	2. 02	.980286	4. 20	.019714	18
43	.839536	2. 20	.858998	2. 02	.980538	4. 22	.019462	17
44	.839668	2. 20	.858877	2. 02	.980791	4. 22	.019209	16
45	.839800	2. 20	.858756	2. 02	.981044	4. 22	.018956	15
46	.839932	2. 20	.858635	2. 02	.981297	4. 22	.018703	14
47	.840064	2. 20	.858514	2. 02	.981550	4. 22	.018450	13
48	.840196	2. 20	.858393	2. 02	.981803	4. 22	.018197	12
49	.840328	2. 20	.858272	2. 02	.982056	4. 22	.017944	11
50	.840459	2. 18	.858151	2. 03	.982309	4. 22	.017691	10
51	9. 840591	2. 18	9. 858029	2. 02	9. 982562	4. 20	10. 017438	9
52	.840722	2. 20	.857908	2. 03	.982814	4. 22	.017186	8
53	.840854	2. 18	.857786	2. 02	.983067	4. 22	.016933	7
54	.840985	2. 18	.857665	2. 03	.983320	4. 22	.016680	6
55	.841116	2. 18	.857543	2. 02	.983573	4. 22	.016427	5
56	.841247	2. 18	.857422	2. 03	.983826	4. 22	.016174	4
57	.841378	2. 18	.857300	2. 03	.984079	4. 22	.015921	3
58	.841509	2. 18	.857178	2. 03	.984332	4. 20	.015668	2
59	.841640	2. 18	.857056	2. 03	.984584	4. 22	.015416	1
60	9. 841771		9. 856934		9. 984837		10. 015163	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

′	Sine.	D. 1″.	Cosine.	D. 1″.	Tang.	D. 1″.	Cotang.	′
0	9.841771	2.18	9.856934	2.03	9.984837	4.22	10.015163	60
1	.841902	2.18	.856812	2.03	.985090	4.22	.014910	59
2	.842033	2.17	.856690	2.03	.985343	4.22	.014657	58
3	.842163	2.18	.856568	2.03	.985596	4.20	.014404	57
4	.842294	2.17	.856446	2.05	.985848	4.22	.014152	56
5	.842424	2.18	.856323	2.03	.986101	4.22	.013899	55
6	.842555	2.17	.856201	2.05	.986354	4.22	.013646	54
7	.842685	2.17	.856078	2.03	.986607	4.22	.013393	53
8	.842815	2.18	.855956	2.05	.986860	4.20	.013140	52
9	.842946	2.17	.855833	2.03	.987112	4.22	.012888	51
10	.843076	2.17	.855711	2.05	.987365	4.22	.012635	50
11	9.843206	2.17	9.855588	2.05	9.987618	4.22	10.012382	49
12	.843336	2.17	.855465	2.05	.987871	4.20	.012129	48
13	.843466	2.15	.855342	2.05	.988123	4.22	.011877	47
14	.843595	2.17	.855219	2.05	.988376	4.22	.011624	46
15	.843725	2.17	.855096	2.05	.988629	4.22	.011371	45
16	.843855	2.15	.854973	2.05	.988882	4.20	.011118	44
17	.843984	2.17	.854850	2.05	.989134	4.22	.010866	43
18	.844114	2.15	.854727	2.07	.989387	4.22	.010613	42
19	.844243	2.15	.854603	2.05	.989640	4.22	.010360	41
20	.844372	2.17	.854480	2.07	.989893	4.20	.010107	40
21	9.844502	2.15	9.854356	2.05	9.990145	4.22	10.009855	39
22	.844631	2.15	.854233	2.07	.990398	4.22	.009602	38
23	.844760	2.15	.854109	2.05	.990651	4.20	.009349	37
24	.844889	2.15	.853986	2.07	.990903	4.22	.009097	36
25	.845018	2.15	.853862	2.07	.991156	4.22	.008844	35
26	.845147	2.15	.853738	2.07	.991409	4.22	.008591	34
27	.845276	2.15	.853614	2.07	.991662	4.20	.008338	33
28	.845405	2.13	.853490	2.07	.991914	4.22	.008086	32
29	.845533	2.15	.853366	2.07	.992167	4.22	.007833	31
30	.845662	2.13	.853242	2.07	.992420	4.20	.007580	30
31	9.845790	2.15	9.853118	2.07	9.992672	4.22	10.007328	29
32	.845919	2.13	.852994	2.08	.992925	4.22	.007075	28
33	.846047	2.13	.852869	2.07	.993178	4.22	.006822	27
34	.846175	2.15	.852745	2.08	.993431	4.20	.006569	26
35	.846304	2.13	.852620	2.07	.993683	4.22	.006317	25
36	.846432	2.13	.852496	2.08	.993936	4.22	.006064	24
37	.846560	2.13	.852371	2.07	.994189	4.20	.005811	23
38	.846688	2.13	.852247	2.08	.994441	4.22	.005559	22
39	.846816	2.13	.852122	2.08	.994694	4.22	.005306	21
40	.846944	2.12	.851997	2.08	.994947	4.20	.005053	20
41	9.847071	2.13	9.851872	2.08	9.995199	4.22	10.004801	19
42	.847199	2.13	.851747	2.08	.995452	4.22	.004548	18
43	.847327	2.12	.851622	2.08	.995705	4.20	.004295	17
44	.847454	2.13	.851497	2.08	.995957	4.22	.004043	16
45	.847582	2.12	.851372	2.10	.996210	4.22	.003790	15
46	.847709	2.12	.851246	2.08	.996463	4.20	.003537	14
47	.847836	2.13	.851121	2.08	.996715	4.22	.003285	13
48	.847964	2.12	.850996	2.10	.996968	4.22	.003032	12
49	.848091	2.12	.850870	2.08	.997221	4.20	.002779	11
50	.848218	2.12	.850745	2.10	.997473	4.22	.002527	10
51	9.848345	2.12	9.850619	2.10	9.997726	4.22	10.002274	9
52	.848472	2.12	.850493	2.08	.997979	4.20	.002021	8
53	.848599	2.12	.850368	2.10	.998231	4.22	.001769	7
54	.848726	2.10	.850242	2.10	.998484	4.22	.001516	6
55	.848852	2.12	.850116	2.10	.998737	4.20	.001263	5
56	.848979	2.12	.849990	2.10	.998989	4.22	.001011	4
57	.849106	2.10	.849864	2.10	.999242	4.22	.000758	3
58	.849232	2.12	.849738	2.12	.999495	4.20	.000505	2
59	.849359	2.10	.849611	2.10	.999747	4.22	.000253	1
60	9.849485		9.849485		10.000000		10.000000	0
′	Cosine.	D. 1″.	Sine.	D. 1″.	Cotang.	D. 1″.	Tang.	′

No. 100 L. 000.] [No. 109 L. 040.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
100	000000	0434	0868	1301	1734	2166	2598	3029	3461	3891	432
1	4321	4751	5181	5609	6038	6466	6894	7321	7748	8174	428
2	8600	9026	9451	9876							
					0300	0724	1147	1570	1993	2415	424
3	012837	3259	3680	4100	4521	4940	5360	5779	6197	6616	420
4	7033	7451	7868	8284	8700	9116	9532	9947			
									0361	0775	416
5	021189	1603	2016	2428	2841	3252	3664	4075	4486	4896	412
6	5306	5715	6125	6533	6942	7350	7757	8164	8571	8978	408
7	9384	9789									
			0195	0600	1004	1408	1812	2216	2619	3021	404
8	033424	3826	4227	4628	5029	5430	5830	6230	6629	7028	400
9	7426	7825	8223	8620	9017	9414	9811				
	04							0207	0602	0998	397

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
434	43.4	86.8	130.2	173 6	217.0	260.4	303.8	347.2	390.6
433	43.3	86.6	129.9	173.2	216.5	259.8	303.1	346.4	389.7
432	43.2	86.4	129.6	172.8	216.0	259.2	302.4	345.6	388.8
431	43.1	86.2	129.3	172.4	215.5	258.6	301.7	344.8	387.9
430	43.0	86.0	129.0	172.0	215.0	258.0	301.0	344.0	387.0
429	42.9	85.8	128.7	171.6	214.5	257.4	300.3	343.2	386.1
428	42.8	85.6	128.4	171.2	214.0	256.8	299.6	342.4	385.2
427	42.7	85.4	128.1	170.8	213.5	256.2	298.9	341.6	384.3
426	42.6	85.2	127.8	170.4	213.0	255.6	298.2	340.8	383.4
425	42.5	85.0	127.5	170.0	212.5	255.0	297.5	340.0	382.5
424	42.4	84.8	127.2	169.6	212.0	254.4	296.8	339.2	381.6
423	42.3	84.6	126.9	169.2	211.5	253.8	296.1	338.4	380.7
422	42.2	84.4	126.6	168.8	211.0	253.2	295.4	337.6	379.8
421	42.1	84 2	126.3	168.4	210.5	252.6	294.7	336.8	378.9
420	42.0	84.0	126.0	168.0	210.0	252.0	294.0	336.0	378.0
419	41.9	83.8	125.7	167.6	209.5	251.4	293.3	335.2	377.1
418	41.8	83.6	125.4	167.2	209.0	250.8	292.6	334.4	376.2
417	41.7	83.4	125.1	166.8	208.5	250.2	291.9	333.6	375.3
416	41.6	83.2	124.8	166.4	208.0	249.6	291.2	332.8	374.4
415	41.5	83.0	124.5	166.0	207.5	249.0	290.5	332.0	373.5
414	41.4	82.8	124.2	165.6	207.0	248.4	289.8	331.2	372.6
413	41.3	82.6	123.9	165.2	206.5	247.8	289.1	330.4	371.7
412	41.2	82.4	123.6	164.8	206.0	247.2	288.4	329.6	370.8
411	41.1	82.2	123.3	164.4	205.5	246.6	287.7	328.8	369.9
410	41.0	82.0	123.0	164.0	205.0	246.0	287.0	328.0	369.0
409	40.9	81.8	122.7	163.6	204.5	245.4	286.3	327.2	368.1
408	40.8	81.6	122.4	163.2	204.0	244.8	285.6	326.4	367.2
407	40.7	81.4	122.1	162.8	203.5	244.2	284.9	325.6	366.3
406	40.6	81.2	121.8	162.4	203.0	243.6	284.2	324.8	365.4
405	40.5	81.0	121.5	162.0	202.5	243.0	283.5	324.0	364.5
404	40.4	80.8	121.2	161.6	202.0	242.4	282.8	323.2	363.6
403	40.3	80.6	120.9	161.2	201.5	241.8	282.1	322.4	362.7
402	40.2	80.4	120.6	160.8	201.0	241.2	281.4	321.6	361.8
401	40.1	80.2	120.3	160.4	200.5	240.6	280.7	320.8	360.9
400	40.0	80.0	120.0	160.0	200.0	240.0	280.0	320.0	360.0
399	39.9	79.8	119.7	159.6	199.5	239.4	279.3	319.2	359.1
398	39.8	79.6	119.4	159.2	199.0	238.8	278.6	318.4	358.2
397	39.7	79.4	119.1	158.8	198.5	238.2	277.9	317.6	357.3
396	39.6	79.2	118.8	158.4	198.0	237.6	277.2	316.8	356.4
395	39.5	79.0	118.5	158.0	197.5	237.0	276.5	316.0	355.5

No. 110 L. 041.] [No. 119 L. 078.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
110	041393	1787	2182	2576	2969	3362	3755	4148	4540	4932	393
1	5323	5714	6105	6495	6885	7275	7664	8053	8442	8830	390
2	9218	9606	9993								
				0380	0766	1153	1538	1924	2309	2694	386
3	053078	3463	3846	4230	4613	4996	5378	5760	6142	6524	383
4	6905	7286	7666	8046	8426	8805	9185	9563	9942		
										0320	379
5	060698	1075	1452	1829	2206	2582	2958	3333	3709	4083	376
6	4458	4832	5206	5580	5953	6326	6699	7071	7443	7815	373
7	8186	8557	8928	9298	9668						
						0038	0407	0776	1145	1514	370
8	071882	2250	2617	2985	3352	3718	4085	4451	4816	5182	366
9	5547	5912	6276	6640	7004	7368	7731	8094	8457	8819	363

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
395	39.5	79.0	118.5	158.0	197.5	237.0	276.5	316.0	355.5
394	39.4	78.8	118.2	157.6	197.0	236.4	275.8	315.2	354.6
393	39.3	78.6	117.9	157.2	196.5	235.8	275.1	314.4	353.7
392	39.2	78.4	117.6	156.8	196.0	235.2	274.4	313.6	352.8
391	39.1	78.2	117.3	156.4	195.5	234.6	273.7	312.8	351.9
390	39.0	78.0	117.0	156.0	195.0	234.0	273.0	312.0	351.0
389	38.9	77.8	116.7	155.6	194.5	233.4	272.3	311.2	350.1
388	38.8	77.6	116.4	155.2	194.0	232.8	271.6	310.4	349.2
387	38.7	77.4	116.1	154.8	193.5	232.2	270.9	309.6	348.3
386	38.6	77.2	115.8	154.4	193.0	231.6	270.2	308.8	347.4
385	38.5	77.0	115.5	154.0	192.5	231.0	269.5	308.0	346.5
384	38.4	76.8	115.2	153.6	192.0	230.4	268.8	307.2	345.6
383	38.3	76.6	114.9	153.2	191.5	229.8	268.1	306.4	344.7
382	38.2	76.4	114.6	152.8	191.0	229.2	267.4	305.6	343.8
381	38.1	76.2	114.3	152.4	190.5	228.6	266.7	304.8	342.9
380	38.0	76.0	114.0	152.0	190.0	228.0	266.0	304.0	342.0
379	37.9	75.8	113.7	151.6	189.5	227.4	265.3	303.2	341.1
378	37.8	75.6	113.4	151.2	189.0	226.8	264.6	302.4	340.2
377	37.7	75.4	113.1	150.8	188.5	226.2	263.9	301.6	339.3
376	37.6	75.2	112.8	150.4	188.0	225.6	263.2	300.8	338.4
375	37.5	75.0	112.5	150.0	187.5	225.0	262.5	300.0	337.5
374	37.4	74.8	112.2	149.6	187.0	224.4	261.8	299.2	336.6
373	37.3	74.6	111.9	149.2	186.5	223.8	261.1	298.4	335.7
372	37.2	74.4	111.6	148.8	186.0	223.2	260.4	297.6	334.8
371	37.1	74.2	111.3	148.4	185.5	222.6	259.7	296.8	333.9
370	37.0	74.0	111.0	148.0	185.0	222.0	259.0	296.0	333.0
369	36.9	73.8	110.7	147.6	184.5	221.4	258.3	295.2	332.1
368	36.8	73.6	110.4	147.2	184.0	220.8	257.6	294.4	331.2
367	36.7	73.4	110.1	146.8	183.5	220.2	256.9	293.6	330.3
366	36.6	73.2	109.8	146.4	183.0	219.6	256.2	292.8	329.4
365	36.5	73.0	109.5	146.0	182.5	219.0	255.7	292.0	328.5
364	36.4	72.8	109.2	145.6	182.0	218.4	254.8	291.2	327.6
363	36.3	72.6	108.9	145.2	181.5	217.8	254.1	290.4	326.7
362	36.2	72.4	108.6	144.8	181.0	217.2	253.4	289.6	325.8
361	36.1	72.2	108.3	144.4	180.5	216.6	252.7	288.8	324.9
360	36.0	72.0	108.0	144.0	180.0	216.0	252.0	288.0	324.0
359	35.9	71.8	107.7	143.6	179.5	215.4	251.3	287.2	323.1
358	35.8	71.6	107.4	143.2	179.0	214.8	250.6	286.4	322.2
357	35.7	71.4	107.1	142.8	178.5	214.2	249.9	285.6	321.3
356	35.6	71.2	106.8	142.4	178.0	213.6	249.2	284.8	320.4

No. 120 L. 079.] [No. 134 L. 130.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
120	079181	9543	9904								
				0266	0626	0987	1347	1707	2067	2426	360
1	082785	3144	3503	3861	4219	4576	4934	5291	5647	6004	357
2	6360	6716	7071	7426	7781	8136	8490	8845	9198	9552	355
3	9905										
		0258	0611	0963	1315	1667	2018	2370	2721	3071	352
4	093422	3772	4122	4471	4820	5169	5518	5866	6215	6562	349
5	6910	7257	7604	7951	8298	8644	8990	9335	9681		
										0026	346
6	100371	0715	1059	1403	1747	2091	2434	2777	3119	3462	343
7	3804	4146	4487	4828	5169	5510	5851	6191	6531	6871	341
8	7210	7549	7888	8227	8565	8903	9241	9579	9916		
										0253	338
9	110590	0926	1263	1599	1934	2270	2605	2940	3275	3609	335
130	3943	4277	4611	4944	5278	5611	5943	6276	6608	6940	333
1	7271	7603	7934	8265	8595	8926	9256	9586	9915		
										0245	330
2	120574	0903	1231	1560	1888	2216	2544	2871	3198	3525	328
3	3852	4178	4504	4830	5156	5481	5806	6131	6456	6781	325
4	7105	7429	7753	8076	8399	8722	9045	9368	9690		
	13									0012	323

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
355	35.5	71.0	106.5	142.0	177.5	213.0	248.5	284.0	319.5
354	35.4	70.8	106.2	141.6	177.0	212.4	247.8	283.2	318.6
353	35.3	70.6	105.9	141.2	176.5	211.8	247.1	282.4	317.7
352	35.2	70.4	105.6	140.8	176.0	211.2	246.4	281.6	316.8
351	35.1	70.2	105.3	140.4	175.5	210.6	245.7	280.8	315.9
350	35.0	70.0	105.0	140.0	175.0	210.0	245.0	280.0	315.0
349	34.9	69.8	104.7	139.6	174.5	209.4	244.3	279.2	314.1
348	34.8	69.6	104.4	139.2	174.0	208.8	243.6	278.4	313.2
347	34.7	69.4	104.1	138.8	173.5	208.2	242.9	277.6	312.3
346	34.6	69.2	103.8	138.4	173.0	207.6	242.2	276.8	311.4
345	34.5	69.0	103.5	138.0	172.5	207.0	241.5	276.0	310.5
344	34.4	68.8	103.2	137.6	172.0	206.4	240.8	275.2	309.6
343	34.3	68.6	102.9	137.2	171.5	205.8	240.1	274.4	308.7
342	34.2	68.4	102.6	136.8	171.0	205.2	239.4	273.6	307.8
341	34.1	68.2	102.3	136.4	170.5	204.6	238.7	272.8	306.9
340	34.0	68.0	102.0	136.0	170.0	204.0	238.0	272.0	306.0
339	33.9	67.8	101.7	135.6	169.5	203.4	237.3	271.2	305.1
338	33.8	67.6	101.4	135.2	169.0	202.8	236.6	270.4	304.2
337	33.7	67.4	101.1	134.8	168.5	202.2	235.9	269.6	303.3
336	33.6	67.2	100.8	134.4	168.0	201.6	235.2	268.8	302.4
335	33.5	67.0	100.5	134.0	167.5	201.0	234.5	268.0	301.5
334	33.4	66.8	100.2	133.6	167.0	200.4	233.8	267.2	300.6
333	33.3	66.6	99.9	133.2	166.5	199.8	233.1	266.4	299.7
332	33.2	66.4	99.6	132.8	166.0	199.2	232.4	265.6	298.8
331	33.1	66.2	99.3	132.4	165.5	198.6	231.7	264.8	297.9
330	33.0	66.0	99.0	132.0	165.0	198.0	231.0	264.0	297.0
329	32.9	65.8	98.7	131.6	164.5	197.4	230.3	263.2	296.1
328	32.8	65.6	98.4	131.2	164.0	196.8	229.6	262.4	295.2
327	32.7	65.4	98.1	130.8	163.5	196.2	228.9	261.6	294.3
326	32.6	65.2	97.8	130.4	163.0	195.6	228.2	260.8	293.4
325	32.5	65.0	97.5	130.0	162.5	195.0	227.5	260.0	292.5
324	32.4	64.8	97.2	129.6	162.0	194.4	226.8	259.2	291.6
323	32.3	64.6	96.9	129.2	161.5	193.8	226.1	258.4	290.7
322	32.2	64.4	96.6	128.8	161.0	193.2	225.4	257.6	289.8

No. 135 L. 130.] [No. 149 L. 175.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
135	130334	0655	0977	1298	1619	1939	2260	2580	2900	3219	321
6	3539	3858	4177	4496	4814	5133	5451	5769	6086	6403	318
7	6721	7037	7354	7671	7987	8303	8618	8934	9249	9564	316
8	9879										
		0194	0508	0822	1136	1450	1763	2076	2389	2702	314
9	143015	3327	3639	3951	4263	4574	4885	5196	5507	5818	311
140	6128	6438	6748	7058	7367	7676	7985	8294	8603	8911	309
1	9219	9527	9835								
				0142	0449	0756	1063	1370	1676	1982	307
2	152288	2594	2900	3205	3510	3815	4120	4424	4728	5032	305
3	5336	5640	5943	6246	6549	6852	7154	7457	7759	8061	303
4	8362	8664	8965	9266	9567	9868					
							0168	0469	0769	1068	301
5	161368	1667	1967	2266	2564	2863	3161	3460	3758	4055	299
6	4353	4650	4947	5244	5541	5838	6134	6430	6726	7022	297
7	7317	7613	7908	8203	8497	8792	9086	9380	9674	9968	295
8	170262	0555	0848	1141	1434	1726	2019	2311	2603	2895	293
9	3186	3478	3769	4060	4351	4641	4932	5222	5512	5802	291

Proportional Parts.

Diff.	1	2	3	4	5	6	7	8	9
321	32.1	64.2	96.3	128.4	160.5	192.6	224.7	256.8	288.9
320	32.0	64.0	96.0	128.0	160.0	192.0	224.0	256.0	288.0
319	31.9	63.8	95.7	127.6	159.5	191.4	223.3	255.2	287.1
318	31.8	63.6	95.4	127.2	159.0	190.8	222.6	254.4	286.2
317	31.7	63.4	95.1	126.8	158.5	190.2	221.9	253.6	285.3
316	31.6	63.2	94.8	126.4	158.0	189.6	221.2	252.8	284.4
315	31.5	63.0	94.5	126.0	157.5	189.0	220.5	252.0	283.5
314	31.4	62.8	94.2	125.6	157.0	188.4	219.8	251.2	282.6
313	31.3	62.6	93.9	125.2	156.5	187.8	219.1	250.4	281.7
312	31.2	62.4	93.6	124.8	156.0	187.2	218.4	249.6	280.8
311	31.1	62.2	93.3	124.4	155.5	186.6	217.7	248.8	279.9
310	31.0	62.0	93.0	124.0	155.0	186.0	217.0	248.0	279.0
309	30.9	61.8	92.7	123.6	154.5	185.4	216.3	247.2	278.1
308	30.8	61.6	92.4	123.2	154.0	184.8	215.6	246.4	277.2
307	30.7	61.4	92.1	122.8	153.5	184.2	214.9	245.6	276.3
306	30.6	61.2	91.8	122.4	153.0	183.6	214.2	244.8	275.4
305	30.5	61.0	91.5	122.0	152.5	183.0	213.5	244.0	274.5
304	30.4	60.8	91.2	121.6	152.0	182.4	212.8	243.2	273.6
303	30.3	60.6	90.9	121.2	151.5	181.8	212.1	242.4	272.7
302	30.2	60.4	90.6	120.8	151.0	181.2	211.4	241.6	271.8
301	30.1	60.2	90.3	120.4	150.5	180.6	210.7	240.8	270.9
300	30.0	60.0	90.0	120.0	150.0	180.0	210.0	240.0	270.0
299	29.9	59.8	89.7	119.6	149.5	179.4	209.3	239.2	269.1
298	29.8	59.6	89.4	119.2	149.0	178.8	208.6	238.4	268.2
297	29.7	59.4	89.1	118.8	148.5	178.2	207.9	237.6	267.3
296	29.6	59.2	88.8	118.4	148.0	177.6	207.2	236.8	266.4
295	29.5	59.0	88.5	118.0	147.5	177.0	206.5	236.0	265.5
294	29.4	58.8	88.2	117.6	147.0	176.4	205.8	235.2	264.6
293	29.3	58.6	87.9	117.2	146.5	175.8	205.1	234.4	263.7
292	29.2	58.4	87.6	116.8	146.0	175.2	204.4	233.6	262.8
291	29.1	58.2	87.3	116.4	145.5	174.6	203.7	232.8	261.9
290	29.0	58.0	87.0	116.0	145.0	174.0	203.0	232.0	261.0
289	28.9	57.8	86.7	115.6	144.5	173.4	202.3	231.2	260.1
288	28.8	57.6	86.4	115.2	144.0	172.8	201.6	230.4	259.2
287	28.7	57.4	86.1	114.8	143.5	172.2	200.9	229.6	258.3
286	28.6	57.2	85.8	114.4	143.0	171.6	200.2	228.8	257.4

No. 150 L. 176.] [No. 169 L. 230.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
150	176091	6381	6670	6959	7248	7536	7825	8113	8401	8689	289
1	8977	9264	9552	9839							
					0126	0413	0699	0986	1272	1558	287
2	181844	2129	2415	2700	2985	3270	3555	3839	4123	4407	285
3	4691	4975	5259	5542	5825	6108	6391	6674	6956	7239	283
4	7521	7803	8084	8366	8647	8928	9209	9490	9771		
										0051	281
5	190332	0612	0892	1171	1451	1730	2010	2289	2567	2846	279
6	3125	3403	3681	3959	4237	4514	4792	5069	5346	5623	278
7	5900	6176	6453	6729	7005	7281	7556	7832	8107	8382	276
8	8657	8932	9206	9481	9755						
						0029	0303	0577	0850	1124	274
9	201397	1670	1943	2216	2488	2761	3033	3305	3577	3848	272
160	4120	4391	4663	4934	5204	5475	5746	6016	6286	6556	271
1	6826	7096	7365	7634	7904	8173	8441	8710	8979	9247	269
2	9515	9783									
			0051	0319	0586	0853	1121	1388	1654	1921	267
3	212188	2454	2720	2986	3252	3518	3783	4049	4314	4579	266
4	4844	5109	5373	5638	5902	6166	6430	6694	6957	7221	264
5	7484	7747	8010	8273	8536	8798	9060	9323	9585	9846	262
6	220108	0370	0631	0892	1153	1414	1675	1936	2196	2456	261
7	2716	2976	3236	3496	3755	4015	4274	4533	4792	5051	259
8	5309	5568	5826	6084	6342	6600	6858	7115	7372	7630	258
9	7887	8144	8400	8657	8913	9170	9426	9682	9938		
	23									0193	256

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
285	28.5	57.0	85.5	114.0	142.5	171.0	199.5	228.0	256.5
284	28.4	56.8	85.2	113.6	142.0	170.4	198.8	227.2	255.6
283	28.3	56.6	84.9	113.2	141.5	169.8	198.1	226.4	254.7
282	28.2	56.4	84.6	112.8	141.0	169.2	197.4	225.6	253.8
281	28.1	56.2	84.3	112.4	140.5	168.6	196.7	224.8	252.9
280	28.0	56.0	84.0	112.0	140.0	168.0	196.0	224.0	252.0
279	27.9	55.8	83.7	111.6	139.5	167.4	195.3	223.2	251.1
278	27.8	55.6	83.4	111.2	139.0	166.8	194.6	222.4	250.2
277	27.7	55.4	83.1	110.8	138.5	166.2	193.9	221.6	249.3
276	27.6	55.2	82.8	110.4	138.0	165.6	193.2	220.8	248.4
275	27.5	55.0	82.5	110.0	137.5	165.0	192.5	220.0	247.5
274	27.4	54.8	82.2	109.6	137.0	164.4	191.8	219.2	246.6
273	27.3	54.6	81.9	109.2	136.5	163.8	191.1	218.4	245.7
272	27.2	54.4	81.6	108.8	136.0	163.2	190.4	217.6	244.8
271	27.1	54.2	81.3	108.4	135.5	162.6	189.7	216.8	243.9
270	27.0	54.0	81.0	108.0	135.0	162.0	189.0	216.0	243.0
269	26.9	53.8	80.7	107.6	134.5	161.4	188.3	215.2	242.1
268	26.8	53.6	80.4	107.2	134.0	160.8	187.6	214.4	241.2
267	26.7	53.4	80.1	106.8	133.5	160.2	186.9	213.6	240.3
266	26.6	53.2	79.8	106.4	133.0	159.6	186.2	212.8	239.4
265	26.5	53.0	79.5	106.0	132.5	159.0	185.5	212.0	238.5
264	26.4	52.8	79.2	105.6	132.0	158.4	184.8	211.2	237.6
263	26.3	52.6	78.9	105.2	131.5	157.8	184.1	210.4	236.7
262	26.2	52.4	78.6	104.8	131.0	157.2	183.4	209.6	235.8
261	26.1	52.2	78.3	104.4	130.5	156.6	182.7	208.8	234.9
260	26.0	52.0	78.0	104.0	130.0	156.0	182.0	208.0	234.0
259	25.9	51.8	77.7	103.6	129.5	155.4	181.3	207.2	233.1
258	25.8	51.6	77.4	103.2	129.0	154.8	180.6	206.4	232.2
257	25.7	51.4	77.1	102.8	128.5	154.2	179.9	205.6	231.3
256	25.6	51.2	76.8	102.4	128.0	153.6	179.2	204.8	230.4
255	25.5	51.0	76.5	102.0	127.5	153.0	178.5	204.0	229.5

No. 170 L. 230.] [No. 189 L. 278.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
170	230449	0704	0960	1215	1470	1724	1979	2234	2488	2742	255
1	2996	3250	3504	3757	4011	4264	4517	4770	5023	5276	253
2	5528	5781	6033	6285	6537	6789	7041	7292	7544	7795	252
3	8046	8297	8548	8799	9049	9299	9550	9800			
									0050	0300	250
4	240549	0799	1048	1297	1546	1795	2044	2293	2541	2790	249
5	3038	3286	3534	3782	4030	4277	4525	4772	5019	5266	248
6	5513	5759	6006	6252	6499	6745	6991	7237	7482	7728	246
7	7973	8219	8464	8709	8954	9198	9443	9687	9932		
										0176	245
8	250420	0664	0908	1151	1395	1638	1881	2125	2368	2610	243
9	2853	3096	3338	3580	3822	4064	4306	4548	4790	5031	242
180	5273	5514	5755	5996	6237	6477	6718	6958	7198	7439	241
1	7679	7918	8158	8398	8637	8877	9116	9355	9594	9833	239
2	260071	0310	0548	0787	1025	1263	1501	1739	1976	2214	238
3	2451	2688	2925	3162	3399	3636	3873	4109	4346	4582	237
4	4818	5054	5290	5525	5761	5996	6232	6467	6702	6937	235
5	7172	7406	7641	7875	8110	8344	8578	8812	9046	9279	234
6	9513	9746	9980								
				0213	0446	0679	0912	1144	1377	1609	233
7	271842	2074	2306	2538	2770	3001	3233	3464	3696	3927	232
8	4158	4389	4620	4850	5081	5311	5542	5772	6002	6232	230
9	6462	6692	6921	7151	7380	7609	7838	8067	8296	8525	229

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
255	25.5	51.0	76.5	102.0	127.5	153.0	178.5	204.0	229.5
254	25.4	50.8	76.2	101.6	127.0	152.4	177.8	203.2	228.6
253	25.3	50.6	75.9	101.2	126.5	151.8	177.1	202.4	227.7
252	25.2	50.4	75.6	100.8	126.0	151.2	176.4	201.6	226.8
251	25.1	50.2	75.3	100.4	125.5	150.6	175.7	200.8	225.9
250	25.0	50.0	75.0	100.0	125.0	150.0	175.0	200.0	225.0
249	24.9	49.8	74.7	99.6	124.5	149.4	174.3	199.2	224.1
248	24.8	49.6	74.4	99.2	124.0	148.8	173.6	198.4	223.2
247	24.7	49.4	74.1	98.8	123.5	148.2	172.9	197.6	222.3
246	24.6	49.2	73.8	98.4	123.0	147.6	172.2	196.8	221.4
245	24.5	49.0	73.5	98.0	122.5	147.0	171.5	196.0	220.5
244	24.4	48.8	73.2	97.6	122.0	146.4	170.8	195.2	219.6
243	24.3	48.6	72.9	97.2	121.5	145.8	170.1	194.4	218.7
242	24.2	48.4	72.6	96.8	121.0	145.2	169.4	193.6	217.8
241	24.1	48.2	72.3	96.4	120.5	144.6	168.7	192.8	216.9
240	24.0	48.0	72.0	96.0	120.0	144.0	168.0	192.0	216.0
239	23.9	47.8	71.7	95.6	119.5	143.4	167.3	191.2	215.1
238	23.8	47.6	71.4	95.2	119.0	142.8	166.6	190.4	214.2
237	23.7	47.4	71.1	94.8	118.5	142.2	165.9	189.6	213.3
236	23.6	47.2	70.8	94.4	118.0	141.6	165.2	188.8	212.4
235	23.5	47.0	70.5	94.0	117.5	141.0	164.5	188.0	211.5
234	23.4	46.8	70.2	93.6	117.0	140.4	163.8	187.2	210.6
233	23.3	46.6	69.9	93.2	116.5	139.8	163.1	186.4	209.7
232	23.2	46.4	69.6	92.8	116.0	139.2	162.4	185.6	208.8
231	23.1	46.2	69.3	92.4	115.5	138.6	161.7	184.8	207.9
230	23.0	46.0	69.0	92.0	115.0	138.0	161.0	184.0	207.0
229	22.9	45.8	68.7	91.6	114.5	137.4	160.3	183.2	206.1
228	22.8	45.6	68.4	91.2	114.0	136.8	159.6	182.4	205.2
227	22.7	45.4	68.1	90.8	113.5	136.2	158.9	181.6	204.3
226	22.6	45.2	67.8	90.4	113.0	135.6	158.2	180.8	203.4

No. 190 L. 278.] [No. 214 L. 332.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
190	278754	8982	9211	9439	9667	9895					
							0123	0351	0578	0806	228
1	281033	1261	1488	1715	1942	2169	2396	2622	2849	3075	227
2	3301	3527	3753	3979	4205	4431	4656	4882	5107	5332	226
3	5557	5782	6007	6232	6456	6681	6905	7130	7354	7578	225
4	7802	8026	8249	8473	8696	8920	9143	9366	9589	9812	223
5	290035	0257	0480	0702	0925	1147	1369	1591	1813	2034	222
6	2256	2478	2699	2920	3141	3363	3584	3804	4025	4246	221
7	4466	4687	4907	5127	5347	5567	5787	6007	6226	6446	220
8	6665	6884	7104	7323	7542	7761	7979	8198	8416	8635	219
9	8853	9071	9289	9507	9725	9943					
							0161	0378	0595	0813	218
200	301030	1247	1464	1681	1898	2114	2331	2547	2764	2980	217
1	3196	3412	3628	3844	4059	4275	4491	4706	4921	5136	216
2	5351	5566	5781	5996	6211	6425	6639	6854	7068	7282	215
3	7496	7710	7924	8137	8351	8564	8778	8991	9204	9417	213
4	9630	9843									
			0056	0268	0481	0693	0906	1118	1330	1542	212
5	311754	1966	2177	2389	2600	2812	3023	3234	3445	3656	211
6	3867	4078	4289	4499	4710	4920	5130	5340	5551	5760	210
7	5970	6180	6390	6599	6809	7018	7227	7436	7646	7854	209
8	8063	8272	8481	8689	8898	9106	9314	9522	9730	9938	208
9	320146	0354	0562	0769	0977	1184	1391	1598	1805	2012	207
210	2219	2426	2633	2839	3046	3252	3458	3665	3871	4077	206
1	4282	4488	4694	4899	5105	5310	5516	5721	5926	6131	205
2	6336	6541	6745	6950	7155	7359	7563	7767	7972	8176	204
3	8380	8583	8787	8991	9194	9398	9601	9805			
									0008	0211	203
4	330414	0617	0819	1022	1225	1427	1630	1832	2034	2236	202

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
225	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5
224	22.4	44.8	67.2	89.6	112.0	134.4	156.8	179.2	201.6
223	22.3	44.6	66.9	89.2	111.5	133.8	156.1	178.4	200.7
222	22.2	44.4	66.6	88.8	111.0	133.2	155.4	177.6	199.8
221	22.1	44.2	66.3	88.4	110.5	132.6	154.7	176.8	198.9
220	22.0	44.0	66.0	88.0	110.0	132.0	154.0	176.0	198.0
219	21.9	43.8	65.7	87.6	109.5	131.4	153.3	175.2	197.1
218	21.8	43.6	65.4	87.2	109.0	130.8	152.6	174.4	196.2
217	21.7	43.4	65.1	86.8	108.5	130.2	151.9	173.6	195.3
216	21.6	43.2	64.8	86.4	108.0	129.6	151.2	172.8	194.4
215	21.5	43.0	64.5	86.0	107.5	129.0	150.5	172.0	193.5
214	21.4	42.8	64.2	85.6	107.0	128.4	149.8	171.2	192.6
213	21.3	42.6	63.9	85.2	106.5	127.8	149.1	170.4	191.7
212	21.2	42.4	63.6	84.8	106.0	127.2	148.4	169.6	190.8
211	21.1	42.2	63.3	84.4	105.5	126.6	147.7	168.8	189.9
210	21.0	42.0	63.0	84.0	105.0	126.0	147.0	168.0	189.0
209	20.9	41.8	62.7	83.6	104.5	125.4	146.3	167.2	188.1
208	20.8	41.6	62.4	83.2	104.0	124.8	145.6	166.4	187.2
207	20.7	41.4	62.1	82.8	103.5	124.2	144.9	165.6	186.3
206	20.6	41.2	61.8	82.4	103.0	123.6	144.2	164.8	185.4
205	20.5	41.0	61.5	82.0	102.5	123.0	143.5	164.0	184.5
204	20.4	40.8	61.2	81.6	102.0	122.4	142.8	163.2	183.6
203	20.3	40.6	60.9	81.2	101.5	121.8	142.1	162.4	182.7
202	20.2	40.4	60.6	80.8	101.0	121.2	141.4	161.6	181.8

No. 215 L. 332.] [No. 239 L. 380.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
215	332438	2640	2842	3044	3246	3447	3649	3850	4051	4253	202
6	4454	4655	4856	5057	5257	5458	5658	5859	6059	6260	201
7	6460	6660	6860	7060	7260	7459	7659	7858	8058	8257	200
8	8456	8656	8855	9054	9253	9451	9650	9849			
									0047	0246	199
9	340444	0642	0841	1039	1237	1435	1632	1830	2028	2225	198
220	2423	2620	2817	3014	3212	3409	3606	3802	3999	4196	197
1	4392	4589	4785	4981	5178	5374	5570	5766	5962	6157	196
2	6353	6549	6744	6939	7135	7330	7525	7720	7915	8110	195
3	8305	8500	8694	8889	9083	9278	9472	9666	9860		
										0054	194
4	350248	0442	0636	0829	1023	1216	1410	1603	1796	1989	193
5	2183	2375	2568	2761	2954	3147	3339	3532	3724	3916	193
6	4108	4301	4493	4685	4876	5068	5260	5452	5643	5834	192
7	6026	6217	6408	6599	6790	6981	7172	7363	7554	7744	191
8	7935	8125	8316	8506	8696	8886	9076	9266	9456	9646	190
9	9835										
		0025	0215	0404	0593	0783	0972	1161	1350	1539	189
230	361728	1917	2105	2294	2482	2671	2859	3048	3236	3424	188
1	3612	3800	3988	4176	4363	4551	4739	4926	5113	5301	188
2	5488	5675	5862	6049	6236	6423	6610	6796	6983	7169	187
3	7356	7542	7729	7915	8101	8287	8473	8659	8845	9030	186
4	9216	9401	9587	9772	9958						
						0143	0328	0513	0698	0883	185
5	371068	1253	1437	1622	1806	1991	2175	2360	2544	2728	184
6	2912	3096	3280	3464	3647	3831	4015	4198	4382	4565	184
7	4748	4932	5115	5298	5481	5664	5846	6029	6212	6394	183
8	6577	6759	6942	7124	7306	7488	7670	7852	8034	8216	182
9	8398	8580	8761	8943	9124	9306	9487	9668	9849		
	38									0030	181

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
202	20.2	40.4	60.6	80.8	101.0	121.2	141.4	161.6	181.8
201	20.1	40.2	60.3	80.4	100.5	120.6	140.7	160.8	180.9
200	20.0	40.0	60.0	80.0	100.0	120.0	140.0	160.0	180.0
199	19.9	39.8	59.7	79.6	99.5	119.4	139.3	159.2	179.1
198	19.8	39.6	59.4	79.2	99.0	118.8	138.6	158.4	178.2
197	19.7	39.4	59.1	78.8	98.5	118.2	137.9	157.6	177.3
196	19.6	39.2	58.8	78.4	98.0	117.6	137.2	156.8	176.4
195	19.5	39.0	58.5	78.0	97.5	117.0	136.5	156.0	175.5
194	19.4	38.8	58.2	77.6	97.0	116.4	135.8	155.2	174.6
193	19.3	38.6	57.9	77.2	96.5	115.8	135.1	154.4	173.7
192	19.2	38.4	57.6	76.8	96.0	115.2	134.4	153.6	172.8
191	19.1	38.2	57.3	76.4	95.5	114.6	133.7	152.8	171.9
190	19.0	38.0	57.0	76.0	95.0	114.0	133.0	152.0	171.0
189	18.9	37.8	56.7	75.6	94.5	113.4	132.3	151.2	170.1
188	18.8	37.6	56.4	75.2	94.0	112.8	131.6	150.4	169.2
187	18.7	37.4	56.1	74.8	93.5	112.2	130.9	149.6	168.3
186	18.6	37.2	55.8	74.4	93.0	111.6	130.2	148.8	167.4
185	18.5	37.0	55.5	74.0	92.5	111.0	129.5	148.0	166.5
184	18.4	36.8	55.2	73.6	92.0	110.4	128.8	147.2	165.6
183	18.3	36.6	54.9	73.2	91.5	109.8	128.1	146.4	164.7
182	18.2	36.4	54.6	72.8	91.0	109.2	127.4	145.6	163.8
181	18.1	36.2	54.3	72.4	90.5	108.6	126.7	144.8	162.9
180	18.0	36.0	54.0	72.0	90.0	108.0	126.0	144.0	162.0
179	17.9	35.8	53.7	71.6	89.5	107.4	125.3	143.2	161.1

No. 240 L. 380.] [No. 269 L. 431.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
240	380211	0392	0573	0754	0934	1115	1296	1476	1656	1837	181
1	2017	2197	2377	2557	2737	2917	3097	3277	3456	3636	180
2	3815	3995	4174	4353	4533	4712	4891	5070	5249	5428	179
3	5606	5785	5964	6142	6321	6499	6677	6856	7034	7212	178
4	7390	7568	7746	7924	8101	8279	8456	8634	8811	8989	178
5	9166	9343	9520	9698	9875						
						0051	0228	0405	0582	0759	177
6	390935	1112	1288	1464	1641	1817	1993	2169	2345	2521	176
7	2697	2873	3048	3224	3400	3575	3751	3926	4101	4277	176
8	4452	4627	4802	4977	5152	5326	5501	5676	5850	6025	175
9	6199	6374	6548	6722	6896	7071	7245	7419	7592	7766	174
250	7940	8114	8287	8461	8634	8808	8981	9154	9328	9501	173
1	9674	9847									
			0020	0192	0365	0538	0711	0883	1056	1228	173
2	401401	1573	1745	1917	2089	2261	2433	2605	2777	2949	172
3	3121	3292	3464	3635	3807	3978	4149	4320	4492	4663	171
4	4834	5005	5176	5346	5517	5688	5858	6029	6199	6370	171
5	6540	6710	6881	7051	7221	7391	7561	7731	7901	8070	170
6	8240	8410	8579	8749	8918	9087	9257	9426	9595	9764	169
7	9933										
		0102	0271	0440	0609	0777	0946	1114	1283	1451	169
8	411620	1788	1956	2124	2293	2461	2629	2796	2964	3132	168
9	3300	3467	3635	3803	3970	4137	4305	4472	4639	4806	167
260	4973	5140	5307	5474	5641	5808	5974	6141	6308	6474	167
1	6641	6807	6973	7139	7306	7472	7638	7804	7970	8135	166
2	8301	8467	8633	8798	8964	9129	9295	9460	9625	9791	165
3	9956										
		0121	0286	0451	0616	0781	0945	1110	1275	1439	165
4	421604	1768	1933	2097	2261	2426	2590	2754	2918	3082	164
5	3246	3410	3574	3737	3901	4065	4228	4392	4555	4718	164
6	4882	5045	5208	5371	5534	5697	5860	6023	6186	6349	163
7	6511	6674	6836	6999	7161	7324	7486	7648	7811	7973	162
8	8135	8297	8459	8621	8783	8944	9106	9268	9429	9591	162
9	9752	9914									
	43		0075	0236	0398	0559	0720	0881	1042	1203	161

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
178	17.8	35.6	53.4	71.2	89.0	106.8	124.6	142.4	160.2
177	17.7	35.4	53.1	70.8	88.5	106.2	123.9	141.6	159.3
176	17.6	35.2	52.8	70.4	88.0	105.6	123.2	140.8	158.4
175	17.5	35.0	52.5	70.0	87.5	105.0	122.5	140.0	157.5
174	17.4	34.8	52.2	69.6	87.0	104.4	121.8	139.2	156.6
173	17.3	34.6	51.9	69.2	86.5	103.8	121.1	138.4	155.7
172	17.2	34.4	51.6	68.8	86.0	103.2	120.4	137.6	154.8
171	17.1	34.2	51.3	68.4	85.5	102.6	119.7	136.8	153.9
170	17.0	34.0	51.0	68.0	85.0	102.0	119.0	136.0	153.0
169	16.9	33.8	50.7	67.6	84.5	101.4	118.3	135.2	152.1
168	16.8	33.6	50.4	67.2	84.0	100.8	117.6	134.4	151.2
167	16.7	33.4	50.1	66.8	83.5	100.2	116.9	133.6	150.3
166	16.6	33.2	49.8	66.4	83.0	99.6	116.2	132.8	149.4
165	16.5	33.0	49.5	66.0	82.5	99.0	115.5	132.0	148.5
164	16.4	32.8	49.2	65.6	82.0	98.4	114.8	131.2	147.6
163	16.3	32.6	48.9	65.2	81.5	97.8	114.1	130.4	146.7
162	16.2	32.4	48.5	64.8	81.0	97.2	113.4	129.6	145.8
161	16.1	32.2	48.3	64.4	80.5	96.6	112.7	128.8	144.9

No. 270 L. 431.] [No. 299 L. 476.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
270	431364	1525	1685	1846	2007	2167	2328	2488	2649	2809	161
1	2969	3130	3290	3450	3610	3770	3930	4090	4249	4409	160
2	4569	4729	4888	5048	5207	5367	5526	5685	5844	6004	159
3	6163	6322	6481	6640	6799	6957	7116	7275	7433	7592	159
4	7751	7909	8067	8226	8384	8542	8701	8859	9017	9175	158
5	9333	9491	9648	9806	9964						
						0122	0279	0437	0594	0752	158
6	440909	1066	1224	1381	1538	1695	1852	2009	2166	2323	157
7	2480	2637	2793	2950	3106	3263	3419	3576	3732	3889	157
8	4045	4201	4357	4513	4669	4825	4981	5137	5293	5449	156
9	5604	5760	5915	6071	6226	6382	6537	6692	6848	7003	155
280	7158	7313	7468	7623	7778	7933	8088	8242	8397	8552	155
1	8706	8861	9015	9170	9324	9478	9633	9787	9941		
										0095	154
2	450249	0403	0557	0711	0865	1018	1172	1326	1479	1633	154
3	1786	1940	2093	2247	2400	2553	2706	2859	3012	3165	153
4	3318	3471	3624	3777	3930	4082	4235	4387	4540	4692	153
5	4845	4997	5150	5302	5454	5606	5758	5910	6062	6214	152
6	6366	6518	6670	6821	6973	7125	7276	7428	7579	7731	152
7	7882	8033	8184	8336	8487	8638	8789	8940	9091	9242	151
8	9392	9543	9694	9845	9995						
						0146	0296	0447	0597	0748	151
9	460898	1048	1198	1348	1499	1649	1799	1948	2098	2248	150
290	2398	2548	2697	2847	2997	3146	3296	3445	3594	3744	150
1	3893	4042	4191	4340	4490	4639	4788	4936	5085	5234	149
2	5383	5532	5680	5829	5977	6126	6274	6423	6571	6719	149
3	6868	7016	7164	7312	7460	7608	7756	7904	8052	8206	148
4	8347	8495	8643	8790	8938	9085	9233	9380	9527	9675	148
5	9822	9969									
			0116	0263	0410	0557	0704	0851	0998	1145	147
6	471292	1438	1585	1732	1878	2025	2171	2318	2464	2610	146
7	2756	2903	3049	3195	3341	3487	3633	3779	3925	4071	146
8	4216	4362	4508	4653	4799	4944	5090	5235	5381	5526	146
9	5671	5816	5962	6107	6252	6397	6542	6687	6832	6976	145

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
161	16.1	32.2	48.3	64.4	80.5	96.6	112.7	128.8	144.9
160	16.0	32.0	48.0	64.0	80.0	96.0	112.0	128.0	144.0
159	15.9	31.8	47.7	63.6	79.5	95.4	111.3	127.2	143.1
158	15.8	31.6	47.4	63.2	79.0	94.8	110.6	126.4	142.2
157	15.7	31.4	47.1	62.8	78.5	94.2	109.9	125.6	141.3
156	15.6	31.2	46.8	62.4	78.0	93.6	109.2	124.8	140.4
155	15.5	31.0	46.5	62.0	77.5	93.0	108.5	124.0	139.5
154	15.4	30.8	46.2	61.6	77.0	92.4	107.8	123.2	138.6
153	15.3	30.6	45.9	61.2	76.5	91.8	107.1	122.4	137.7
152	15.2	30.4	45.6	60.8	76.0	91.2	106.4	121.6	136.8
151	15.1	30.2	45.3	60.4	75.5	90.6	105.7	120.8	135.9
150	15.0	30.0	45.0	60.0	75.0	90.0	105.0	120.0	135.0
149	14.9	29.8	44.7	59.6	74.5	89.4	104.3	119.2	134.1
148	14.8	29.6	44.4	59.2	74.0	88.8	103.6	118.4	133.2
147	14.7	29.4	44.1	58.8	73.5	88.2	102.9	117.6	132.3
146	14.6	29.2	43.8	58.4	73.0	87.6	102.2	116.8	131.4
145	14.5	29.0	43.5	58.0	72.5	87.0	101.5	116.0	130.5
144	14.4	28.8	43.2	57.6	72.0	86.4	100.8	115.2	129.6
143	14 3	28.6	42.9	57.2	71.5	85.8	100.1	114.4	128.7
142	14.2	28.4	42.6	56.8	71.0	85.2	99.4	113.6	127.8
141	14.1	28.2	42.3	56.4	70.5	84.6	98.7	112.8	126.9
140	14.0	28.0	42.0	56.0	70.0	84.0	98.0	112.0	126.0

TABLE 10.—LOGARITHMS OF NUMBERS.

[No. 300 L. 477.] [No. 339 L. 531.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
300	477121	7266	7411	7555	7700	7844	7989	8133	8278	8422	145
1	8566	8711	8855	8999	9143	9287	9431	9575	9719	9863	144
2	480007	0151	0294	0438	0582	0725	0869	1012	1156	1299	144
3	1443	1586	1729	1872	2016	2159	2302	2445	2588	2731	143
4	2874	3016	3159	3302	3445	3587	3730	3872	4015	4157	143
5	4300	4442	4585	4727	4869	5011	5153	5295	5437	5579	142
6	5721	5863	6005	6147	6289	6430	6572	6714	6855	6997	142
7	7138	7280	7421	7563	7704	7845	7986	8127	8269	8410	141
8	8551	8692	8833	8974	9114	9255	9396	9537	9677	9818	141
9	9958	0099	0239	0380	0520	0661	0801	0941	1081	1222	140
310	491362	1502	1642	1782	1922	2062	2201	2341	2481	2621	140
1	2760	2900	3040	3179	3319	3458	3597	3737	3876	4015	139
2	4155	4294	4433	4572	4711	4850	4989	5128	5267	5406	139
3	5544	5683	5822	5960	6099	6238	6376	6515	6653	6791	139
4	6930	7068	7206	7344	7483	7621	7759	7897	8035	8173	138
5	8311	8448	8586	8724	8862	8999	9137	9275	9412	9550	138
6	9687	9824	9962	0099	0236	0374	0511	0648	0785	0922	137
7	501059	1196	1333	1470	1607	1744	1880	2017	2154	2291	137
8	2427	2564	2700	2837	2973	3109	3246	3382	3518	3655	136
9	3791	3927	4063	4199	4335	4471	4607	4743	4878	5014	136
320	5150	5286	5421	5557	5693	5828	5964	6099	6234	6370	136
1	6505	6640	6776	6911	7046	7181	7316	7451	7586	7721	135
2	7856	7991	8126	8260	8395	8530	8664	8799	8934	9068	135
3	9203	9337	9471	9606	9740	9874	0009	0143	0277	0411	134
4	510545	0679	0813	0947	1081	1215	1349	1482	1616	1750	134
5	1883	2017	2151	2284	2418	2551	2684	2818	2951	3084	133
6	3218	3351	3484	3617	3750	3883	4016	4149	4282	4415	133
7	4548	4681	4813	4946	5079	5211	5344	5476	5609	5741	133
8	5874	6006	6139	6271	6403	6535	6668	6800	6932	7064	132
9	7196	7328	7460	7592	7724	7855	7987	8119	8251	8382	132
330	8514	8646	8777	8909	9040	9171	9303	9434	9566	9697	131
1	9828	9959	0090	0221	0353	0484	0615	0745	0876	1007	131
2	521138	1269	1400	1530	1661	1792	1922	2053	2183	2314	131
3	2444	2575	2705	2835	2966	3096	3226	3356	3486	3616	130
4	3746	3876	4006	4136	4266	4396	4526	4656	4785	4915	130
5	5045	5174	5304	5434	5563	5693	5822	5951	6081	6210	129
6	6339	6469	6598	6727	6856	6985	7114	7243	7372	7501	129
7	7630	7759	7888	8016	8145	8274	8402	8531	8660	8788	129
8	8917	9045	9174	9302	9430	9559	9687	9815	9943	0072	128
9	530200	0328	0456	0584	0712	0840	0968	1096	1223	1351	128

Proportional Parts.

Diff.	1	2	3	4	5	6	7	8	9
139	13.9	27.8	41.7	55.6	69.5	83.4	97.3	111.2	125.1
138	13.8	27.6	41.4	55.2	69.0	82.8	96.6	110.4	124.2
137	13.7	27.4	41.1	54.8	68.5	82.2	95.9	109.6	123.3
136	13.6	27.2	40.8	54.4	68.0	81.6	95.2	108.8	122.4
135	13.5	27.0	40.5	54.0	67.5	81.0	94.5	108.0	121.5
134	13.4	26.8	40.2	53.6	67.0	80.4	93.8	107.2	120.6
133	13.3	26.6	39.9	53.2	66.5	79.8	93.1	106.4	119.7
132	13.2	26.4	39.6	52.8	66.0	79.2	92.4	105.6	118.8
131	13.1	26.2	39.3	52.4	65.5	78.6	91.7	104.8	117.9
130	13.0	26.0	39.0	52.0	65.0	78.0	91.0	104.0	117.0
129	12.9	25.8	38.7	51.6	64.5	77.4	90.3	103.2	116.1
128	12.8	25.6	38.4	51.2	64.0	76.8	89.6	102.4	115.2
127	12.7	25.4	38.1	50.8	63.5	76.2	88.9	101.6	114.3

No. 340 L. 531.] [No. 379 L. 579.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
340	531479	1607	1734	1862	1990	2117	2245	2372	2500	2627	128
1	2754	2882	3009	3136	3264	3391	3518	3645	3772	3899	127
2	4026	4153	4280	4407	4534	4661	4787	4914	5041	5167	127
3	5294	5421	5547	5674	5800	5927	6053	6180	6306	6432	126
4	6558	6685	6811	6937	7063	7189	7315	7441	7567	7693	126
5	7819	7945	8071	8197	8322	8448	8574	8699	8825	8951	126
6	9076	9202	9327	9452	9578	9703	9829	9954			
									0079	0204	125
7	540329	0455	0580	0705	0830	0955	1080	1205	1330	1454	125
8	1579	1704	1829	1953	2078	2203	2327	2452	2576	2701	125
9	2825	2950	3074	3199	3323	3447	3571	3696	3820	3944	124
350	4068	4192	4316	4440	4564	4688	4812	4936	5060	5183	124
1	5307	5431	5555	5678	5802	5925	6049	6172	6296	6419	124
2	6543	6666	6789	6913	7036	7159	7282	7405	7529	7652	123
3	7775	7898	8021	8144	8267	8389	8512	8635	8758	8881	123
4	9003	9126	9249	9371	9494	9616	9739	9861	9984		
										0106	123
5	550228	0351	0473	0595	0717	0840	0962	1084	1206	1328	122
6	1450	1572	1694	1816	1938	2060	2181	2303	2425	2547	122
7	2668	2790	2911	3033	3155	3276	3398	3519	3640	3762	121
8	3883	4004	4126	4247	4368	4489	4610	4731	4852	4973	121
9	5094	5215	5336	5457	5578	5699	5820	5940	6061	6182	121
360	6303	6423	6544	6664	6785	6905	7026	7146	7267	7387	120
1	7507	7627	7748	7868	7988	8108	8228	8349	8469	8589	120
2	8709	8829	8948	9068	9188	9308	9428	9548	9667	9787	120
3	9907										
		0026	0146	0265	0385	0504	0624	0743	0863	0982	119
4	561101	1221	1340	1459	1578	1698	1817	1936	2055	2174	119
5	2293	2412	2531	2650	2769	2887	3006	3125	3244	3362	119
6	3481	3600	3718	3837	3955	4074	4192	4311	4429	4548	119
7	4666	4784	4903	5021	5139	5257	5376	5494	5612	5730	118
8	5848	5966	6084	6202	6320	6437	6555	6673	6791	6909	118
9	7026	7144	7262	7379	7497	7614	7732	7849	7967	8084	118
370	8202	8319	8436	8554	8671	8788	8905	9023	9140	9257	117
1	9374	9491	9608	9725	9842	9959					
							0076	0193	0309	0426	117
2	570543	0660	0776	0893	1010	1126	1243	1359	1476	1592	117
3	1709	1825	1942	2058	2174	2291	2407	2523	2639	2755	116
4	2872	2988	3104	3220	3336	3452	3568	3684	3800	3915	116
5	4031	4147	4263	4379	4494	4610	4726	4841	4957	5072	116
6	5188	5303	5419	5534	5650	5765	5880	5996	6111	6226	115
7	6341	6457	6572	6687	6802	6917	7032	7147	7262	7377	115
8	7492	7607	7722	7836	7951	8066	8181	8295	8410	8525	115
9	8639	8754	8868	8983	9097	9212	9326	9441	9555	9669	114

Proportional Parts.

Diff.	1	2	3	4	5	6	7	8	9
128	12.8	25.6	38.4	51.2	64.0	76.8	89.6	102.4	115.2
127	12.7	25.4	38.1	50.8	63.5	76.2	88.9	101.6	114.3
126	12.6	25.2	37.8	50.4	63.0	75.6	88.2	100.8	113.4
125	12.5	25.0	37.5	50.0	62.5	75.0	87.5	100.0	112.5
124	12.4	24.8	37.2	49.6	62.0	74.4	86.8	99.2	111.6
123	12.3	24.6	36.9	49.2	61.5	73.8	86.1	98.4	110.7
122	12.2	24.4	36.6	48.8	61.0	73.2	85.4	97.6	109.8
121	12.1	24.2	36.3	48.4	60.5	72.6	84.7	96.8	108.9
120	12.0	24.0	36.0	48.0	60.0	72.0	84.0	96.0	108.0
119	11.9	23.8	35.7	47.6	59.5	71.4	83.3	95.2	107.1

No. 380. L. 579.] [No. 414 L. 617.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
380	579784	9898	0012	0126	0241	0355	0469	0583	0697	0811	114
1	580925	1039	1153	1267	1381	1495	1608	1722	1836	1950	
2	2063	2177	2291	2404	2518	2631	2745	2858	2972	3085	
3	3199	3312	3426	3539	3652	3765	3879	3992	4105	4218	
4	4331	4444	4557	4670	4783	4896	5009	5122	5235	5348	113
5	5461	5574	5686	5799	5912	6024	6137	6250	6362	6475	
6	6587	6700	6812	6925	7037	7149	7262	7374	7486	7599	
7	7711	7823	7935	8047	8160	8272	8384	8496	8608	8720	112
8	8832	8944	9056	9167	9279	9391	9503	9615	9726	9838	
9	9950	0061	0173	0284	0396	0507	0619	0730	0842	0953	
390	591065	1176	1287	1399	1510	1621	1732	1843	1955	2066	
1	2177	2288	2399	2510	2621	2732	2843	2954	3064	3175	111
2	3286	3397	3508	3618	3729	3840	3950	4061	4171	4282	
3	4393	4503	4614	4724	4834	4945	5055	5165	5276	5386	
4	5496	5606	5717	5827	5937	6047	6157	6267	6377	6487	
5	6597	6707	6817	6927	7037	7146	7256	7366	7476	7586	110
6	7695	7805	7914	8024	8134	8243	8353	8462	8572	8681	
7	8791	8900	9009	9119	9228	9337	9446	9556	9665	9774	
8	9883	9992	0101	0210	0319	0428	0537	0646	0755	0864	109
9	600973	1082	1191	1299	1408	1517	1625	1734	1843	1951	
400	2060	2169	2277	2386	2494	2603	2711	2819	2928	3036	
1	3144	3253	3361	3469	3577	3686	3794	3902	4010	4118	108
2	4226	4334	4442	4550	4658	4766	4874	4982	5089	5197	
3	5305	5413	5521	5628	5736	5844	5951	6059	6166	6274	
4	6381	6489	6596	6704	6811	6919	7026	7133	7241	7348	
5	7455	7562	7669	7777	7884	7991	8098	8205	8312	8419	107
6	8526	8633	8740	8847	8954	9061	9167	9274	9381	9488	
7	9594	9701	9808	9914	0021	0128	0234	0341	0447	0554	
8	610660	0767	0873	0979	1086	1192	1298	1405	1511	1617	
9	1723	1829	1936	2042	2148	2254	2360	2466	2572	2678	106
410	2784	2890	2996	3102	3207	3313	3419	3525	3630	3736	
1	3842	3947	4053	4159	4264	4370	4475	4581	4686	4792	
2	4897	5003	5108	5213	5319	5424	5529	5634	5740	5845	
3	5950	6055	6160	6265	6370	6476	6581	6686	6790	6895	105
4	7000	7105	7210	7315	7420	7525	7629	7734	7839	7943	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
118	11.8	23.6	35.4	47.2	59.0	70.8	82.6	94.4	106.2
117	11.7	23.4	35.1	46.8	58.5	70.2	81.9	93.6	105.3
116	11.6	23.2	34.8	46.4	58.0	69.6	81.2	92.8	104.4
115	11.5	23.0	34.5	46.0	57.5	69.0	80.5	92.0	103.5
114	11.4	22.8	34.2	45.6	57.0	68.4	79.8	91.2	102.6
113	11.3	22.6	33.9	45.2	56.5	67.8	79.1	90.4	101.7
112	11.2	22.4	33.6	44.8	56.0	67.2	78.4	89.6	100.8
111	11.1	22.2	33.3	44.4	55.5	66.6	77.7	88.8	99.9
110	11.0	22.0	33.0	44.0	55.0	66.0	77.0	88.0	99.0
109	10.9	21.8	32.7	43.6	54.5	65.4	76.3	87.2	98.1
108	10.8	21.6	32.4	43.2	54.0	64.8	75.6	86.4	97.2
107	10.7	21.4	32.1	42.8	53.5	64.2	74.9	85.6	96.3
106	10.6	21.2	31.8	42.4	53.0	63.6	74.2	84.8	95.4
105	10.5	21.0	31.5	42.0	52.5	63.0	73.5	84.0	94.5
105	10.5	21.0	31.5	42.0	52.5	63.0	73.5	84.0	94.5
104	10.4	20.8	31.2	41.6	52.0	62.4	72.8	83.2	93.6

No. 415 L. 618.] [No. 459 L. 662.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
415	618048	8153	8257	8362	8466	8571	8676	8780	8884	8989	105
6	9093	9198	9302	9406	9511	9615	9719	9824	9928		
										0032	
7	620136	0240	0344	0448	0552	0656	0760	0864	0968	1072	104
8	1176	1280	1384	1488	1592	1695	1799	1903	2007	2110	
9	2214	2318	2421	2525	2628	2732	2835	2939	3042	3146	
420	3249	3353	3456	3559	3663	3766	3869	3973	4076	4179	
1	4282	4385	4488	4591	4695	4798	4901	5004	5107	5210	103
2	5312	5415	5518	5621	5724	5827	5929	6032	6135	6238	
3	6340	6443	6546	6648	6751	6853	6956	7058	7161	7263	
4	7366	7468	7571	7673	7775	7878	7980	8082	8185	8287	
5	8389	8491	8593	8695	8797	8900	9002	9104	9206	9308	
6	9410	9512	9613	9715	9817	9919					102
							0021	0123	0224	0326	
7	630428	0530	0631	0733	0835	0936	1038	1139	1241	1342	
8	1444	1545	1647	1748	1849	1951	2052	2153	2255	2356	
9	2457	2559	2660	2761	2862	2963	3064	3165	3266	3367	
430	3468	3569	3670	3771	3872	3973	4074	4175	4276	4376	101
1	4477	4578	4679	4779	4880	4981	5081	5182	5283	5383	
2	5484	5584	5685	5785	5886	5986	6087	6187	6287	6388	
3	6488	6588	6688	6789	6889	6989	7089	7189	7290	7390	
4	7490	7590	7690	7790	7890	7990	8090	8190	8290	8389	100
5	8489	8589	8689	8789	8888	8988	9088	9188	9287	9387	
6	9486	9586	9686	9785	9885	9984					
							0084	0183	0283	0382	
7	640481	0581	0680	0779	0879	0978	1077	1177	1276	1375	
8	1474	1573	1672	1771	1871	1970	2069	2168	2267	2366	
9	2465	2563	2662	2761	2860	2959	3058	3156	3255	3354	99
440	3453	3551	3650	3749	3847	3946	4044	4143	4242	4340	
1	4439	4537	4636	4734	4832	4931	5029	5127	5226	5324	
2	5422	5521	5619	5717	5815	5913	6011	6110	6208	6306	
3	6404	6502	6600	6698	6796	6894	6992	7089	7187	7285	98
4	7383	7481	7579	7676	7774	7872	7969	8067	8165	8262	
5	8360	8458	8555	8653	8750	8848	8945	9043	9140	9237	
6	9335	9432	9530	9627	9724	9821	9919				
								0016	0113	0210	
7	650308	0405	0502	0599	0696	0793	0890	0987	1084	1181	
8	1278	1375	1472	1569	1666	1762	1859	1956	2053	2150	97
9	2246	2343	2440	2536	2633	2730	2826	2923	3019	3116	
450	3213	3309	3405	3502	3598	3695	3791	3888	3984	4080	
1	4177	4273	4369	4465	4562	4658	4754	4850	4946	5042	
2	5138	5235	5331	5427	5523	5619	5715	5810	5906	6002	96
3	6098	6194	6290	6386	6482	6577	6673	6769	6864	6960	
4	7056	7152	7247	7343	7438	7534	7629	7725	7820	7916	
5	8011	8107	8202	8298	8393	8488	8584	8679	8774	8870	
6	8965	9060	9155	9250	9346	9441	9536	9631	9726	9821	
7	9916										
		0011	0106	0201	0296	0391	0486	0581	0676	0771	95
8	660865	0960	1055	1150	1245	1339	1434	1529	1623	1718	
9	1813	1907	2002	2096	2191	2286	2380	2475	2569	2663	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
105	10.5	21.0	31.5	42.0	52.5	63.0	73.5	84.0	94.5
104	10.4	20.8	31.2	41.6	52.0	62.4	72.8	83.2	93.6
103	10.3	20.6	30.9	41.2	51.5	61.8	72.1	82.4	92.7
102	10.2	20.4	30.6	40.8	51.0	61.2	71.4	81.6	91.8
101	10.1	20.2	30.3	40.4	50.5	60.6	70.7	80.8	90.9
100	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0
99	9.9	19.8	29.7	39.6	49.5	59.4	69.3	79.2	89.1

No. 460 L. 662.] [No. 499 L. 698.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
460	662758	2852	2947	3041	3135	3230	3324	3418	3512	3607	
1	3701	3795	3889	3983	4078	4172	4266	4360	4454	4548	
2	4642	4736	4830	4924	5018	5112	5206	5299	5393	5487	94
3	5581	5675	5769	5862	5956	6050	6143	6237	6331	6424	
4	6518	6612	6705	6799	6892	6986	7079	7173	7266	7360	
5	7453	7546	7640	7733	7826	7920	8013	8106	8199	8293	
6	8386	8479	8572	8665	8759	8852	8945	9038	9131	9224	
7	9317	9410	9503	9596	9689	9782	9875	9967			
									0060	0153	93
8	670246	0339	0431	0524	0617	0710	0802	0895	0988	1080	
9	1173	1265	1358	1451	1543	1636	1728	1821	1913	2005	
470	2098	2190	2283	2375	2467	2560	2652	2744	2836	2929	
1	3021	3113	3205	3297	3390	3482	3574	3666	3758	3850	
2	3942	4034	4126	4218	4310	4402	4494	4586	4677	4769	92
3	4861	4953	5045	5137	5228	5320	5412	5503	5595	5687	
4	5778	5870	5962	6053	6145	6236	6328	6419	6511	6602	
5	6694	6785	6876	6968	7059	7151	7242	7333	7424	7516	
6	7607	7698	7789	7881	7972	8063	8154	8245	8336	8427	
7	8518	8609	8700	8791	8882	8973	9064	9155	92a6	9337	91
8	9428	9519	9610	9700	9791	9882	9973				
									0063	0154	0245
9	680336	0426	0517	0607	0698	0789	0879	0970	1060	1151	
480	1241	1332	1422	1513	1603	1693	1784	1874	1964	2055	
1	2145	2235	2326	2416	2506	2596	2686	2777	2867	2957	
2	3047	3137	3227	3317	3407	3497	3587	3677	3767	3857	90
3	3947	4037	4127	4217	4307	4396	4486	4576	4666	4756	
4	4845	4935	5025	5114	5204	5294	5383	5473	5563	5652	
5	5742	5831	5921	6010	6100	6189	6279	6368	6458	6547	
6	6636	6726	6815	6904	6994	7083	7172	7261	7351	7440	
7	7529	7618	7707	7796	7886	7975	8064	8153	8242	8331	89
8	8420	8509	8598	8687	8776	8865	8953	9042	9131	9220	
9	9309	9398	9486	9575	9664	9753	9841	9930			
									0019	0107	
490	690196	0285	0373	0462	0550	0639	0728	0816	0905	0993	
1	1081	1170	1258	1347	1435	1524	1612	1700	1789	1877	
2	1965	2053	2142	2230	2318	2406	2494	2583	2671	2759	
3	2847	2935	3023	3111	3199	3287	3375	3463	3551	3639	88
4	3727	3815	3903	3991	4078	4166	4254	4342	4430	4517	
5	4605	4693	4781	4868	4956	5044	5131	5219	5307	5394	
6	5482	5569	5657	5744	5832	5919	6007	6094	6182	6269	
7	6356	6444	6531	6618	6706	6793	6880	6968	7055	7142	
8	7229	7317	7404	7491	7578	7665	7752	7839	7926	8014	
9	8100	8188	8275	8362	8449	8535	8622	8709	8796	8883	87

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
98	9.8	19.6	29.4	39.2	49.0	58.8	68.6	78.4	88.2
97	9.7	19.4	29.1	38.8	48.5	58.2	67.9	77.6	87.3
96	9.6	19.2	28.8	38.4	48.0	57.6	67.2	76.8	86.4
95	9.5	19.0	28.5	38.0	47.5	57.0	66.5	76.0	85.5
94	9.4	18.8	28.2	37.6	47.0	56.4	65.8	75.2	84.6
93	9.3	18.6	27.9	37.2	46.5	55.8	65.1	74.4	83.7
92	9.2	18.4	27.6	36.8	46.0	55.2	64.4	73.6	82.8
91	9.1	18.2	27.3	36.4	45.5	54.6	63.7	72.8	81.9
90	9.0	18.0	27.0	36.0	45.0	54.0	63.0	72.0	81.0
89	8.9	17.8	26.7	35.6	44.5	53.4	62.3	71.2	80.1
88	8.8	17.6	26.4	35.2	44.0	52.8	61.6	70.4	79.2
87	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3
86	8.6	17.2	25.8	34.4	43.0	51.6	60.2	68.8	77.4

No. 500 L. 698.]										[No. 544 L. 736.	
N.	0	1	2	3	4	5	6	7	8	9	Diff.
500	698970	9057	9144	9231	9317	9404	9491	9578	9664	9751	
1	9838	9924									
			0011	0098	0184	0271	0358	0444	0531	0617	
2	700704	0790	0877	0963	1050	1136	1222	1309	1395	1482	
3	1568	1654	1741	1827	1913	1999	2086	2172	2258	2344	
4	2431	2517	2603	2689	2775	2861	2947	3033	3119	3205	
5	3291	3377	3463	3549	3635	3721	3807	3893	3979	4065	86
6	4151	4236	4322	4408	4494	4579	4665	4751	4837	4922	
7	5008	5094	5179	5265	5350	5436	5522	5607	5693	5778	
8	5864	5949	6035	6120	6206	6291	6376	6462	6547	6632	
9	6718	6803	6888	6974	7059	7144	7229	7315	7400	7485	
510	7570	7655	7740	7826	7911	7996	8081	8166	8251	8336	85
1	8421	8506	8591	8676	8761	8846	8931	9015	9100	9185	
2	9270	9355	9440	9524	9609	9694	9779	9863	9948		
										0033	
3	710117	0202	0287	0371	0456	0540	0625	0710	0794	0879	
4	0963	1048	1132	1217	1301	1385	1470	1554	1639	1723	
5	1807	1892	1976	2060	2144	2229	2313	2397	2481	2566	
6	2650	2734	2818	2902	2986	3070	3154	3238	3323	3407	84
7	3491	3575	3659	3742	3826	3910	3994	4078	4162	4246	
8	4330	4414	4497	4581	4665	4749	4833	4916	5000	5084	
9	5167	5251	5335	5418	5502	5586	5669	5753	5836	5920	
520	6003	6087	6170	6254	6337	6421	6504	6588	6671	6754	
1	6838	6921	7004	7088	7171	7254	7338	7421	7504	7587	
2	7671	7754	7837	7920	8003	8086	8169	8253	8336	8419	
3	8502	8585	8668	8751	8834	8917	9000	9083	9165	9248	83
4	9331	9414	9497	9580	9663	9745	9828	9911	9994		
										0077	
5	720159	0242	0325	0407	0490	0573	0655	0738	0821	0903	
6	0986	1068	1151	1233	1316	1398	1481	1563	1646	1728	
7	1811	1893	1975	2058	2140	2222	2305	2387	2469	2552	
8	2634	2716	2798	2881	2963	3045	3127	3209	3291	3374	
9	3456	3538	3620	3702	3784	3866	3948	4030	4112	4194	82
530	4276	4358	4440	4522	4604	4685	4767	4849	4931	5013	
1	5095	5176	5258	5340	5422	5503	5585	5667	5748	5830	
2	5912	5993	6075	6156	6238	6320	6401	6483	6564	6646	
3	6727	6809	6890	6972	7053	7134	7216	7297	7379	7460	
4	7541	7623	7704	7785	7866	7948	8029	8110	8191	8273	
5	8354	8435	8516	8597	8678	8759	8841	8922	9003	9084	
6	9165	9246	9327	9408	9489	9570	9651	9732	9813	9893	81
7	9974										
		0055	0136	0217	0298	0378	0459	0540	0621	0702	
8	730782	0863	0944	1024	1105	1186	1266	1347	1428	1508	
9	1589	1669	1750	1830	1911	1991	2072	2152	2233	2313	
540	2394	2474	2555	2635	2715	2796	2876	2956	3037	3117	
1	3197	3278	3358	3438	3518	3598	3679	3759	3839	3919	
2	3999	4079	4160	4240	4320	4400	4480	4560	4640	4720	80
3	4800	4880	4960	5040	5120	5200	5279	5359	5439	5519	
4	5599	5679	5759	5838	5918	5998	6078	6157	6237	6317	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
87	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3
86	8.6	17.2	25.8	34.4	43.0	51.6	60.2	68.8	77.4
85	8.5	17.0	25.5	34.0	42.5	51.0	59.5	68.0	76.5
84	8.4	16.8	25.2	33.6	42.0	50.4	58.8	67.2	75.6

No. 545 L. 736.] [No. 584 L. 767.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
545	736397	6476	6556	6635	6715	6795	6874	6954	7034	7113	
6	7193	7272	7352	7431	7511	7590	7670	7749	7829	7908	
7	7987	8067	8146	8225	8305	8384	8463	8543	8622	8701	
8	8781	8860	8939	9018	9097	9177	9256	9335	9414	9493	
9	9572	9651	9731	9810	9889	9968					
							0047	0126	0205	0284	79
550	740363	0442	0521	0600	0678	0757	0836	0915	0994	1073	
1	1152	1230	1309	1388	1467	1546	1624	1703	1782	1860	
2	1939	2018	2096	2175	2254	2332	2411	2489	2568	2647	
3	2725	2804	2882	2961	3039	3118	3196	3275	3353	3431	
4	3510	3588	3667	3745	3823	3902	3980	4058	4136	4215	
5	4293	4371	4449	4528	4606	4684	4762	4840	4919	4997	
6	5075	5153	5231	5309	5387	5465	5543	5621	5699	5777	78
7	5855	5933	6011	6089	6167	6245	6323	6401	6479	6556	
8	6634	6712	6790	6868	6945	7023	7101	7179	7256	7334	
9	7412	7489	7567	7645	7722	7800	7878	7955	8033	8110	
560	8188	8266	8343	8421	8498	8576	8653	8731	8808	8885	
1	8963	9040	9118	9195	9272	9350	9427	9504	9582	9659	
2	9736	9814	9891	9968							
					0045	0123	0200	0277	0354	0431	
3	750508	0586	0663	0740	0817	0894	0971	1048	1125	1202	
4	1279	1356	1433	1510	1587	1664	1741	1818	1895	1972	
5	2048	2125	2202	2279	2356	2433	2509	2586	2663	2740	77
6	2816	2893	2970	3047	3123	3200	3277	3353	3430	3506	
7	3583	3660	3736	3813	3889	3966	4042	4119	4195	4272	
8	4348	4425	4501	4578	4654	4730	4807	4883	4960	5036	
9	5112	5189	5265	5341	5417	5494	5570	5646	5722	5799	
570	5875	5951	6027	6103	6180	6256	6332	6408	6484	6560	
1	6636	6712	6788	6864	6940	7016	7092	7168	7244	7320	76
2	7396	7472	7548	7624	7700	7775	7851	7927	8003	8079	
3	8155	8230	8306	8382	8458	8533	8609	8685	8761	8836	
4	8912	8988	9063	9139	9214	9290	9366	9441	9517	9592	
5	9668	9743	9819	9894	9970						
						0045	0121	0196	0272	0347	
6	760422	0498	0573	0649	0724	0799	0875	0950	1025	1101	
7	1176	1251	1326	1402	1477	1552	1627	1702	1778	1853	
8	1928	2003	2078	2153	2228	2303	2378	2453	2529	2604	
9	2679	2754	2829	2904	2978	3053	3128	3203	3278	3353	75
580	3428	3503	3578	3653	3727	3802	3877	3952	4027	4101	
1	4176	4251	4326	4400	4475	4550	4624	4699	4774	4848	
2	4923	4998	5072	5147	5221	5296	5370	5445	5520	5594	
3	5669	5743	5818	5892	5966	6041	6115	6190	6264	6338	
4	6413	6487	6562	6636	6710	6785	6859	6933	7007	7082	

Proportional Parts.

Diff.	1	2	3	4	5	6	7	8	9
83	8.3	16.6	24.9	33.2	41.5	49.8	58.1	66.4	74.7
82	8.2	16.4	24.6	32.8	41.0	49.2	57.4	65.6	73.8
81	8.1	16.2	24.3	32.4	40.5	48.6	56.7	64.8	72.9
80	8.0	16.0	24.0	32.0	40.0	48.0	56.0	64.0	72.0
79	7.9	15.8	23.7	31.6	39.5	47.4	55.3	63.2	71.1
78	7.8	15.6	23.4	31.2	39.0	46.8	54.6	62.4	70.2
77	7.7	15.4	23.1	30.8	38.5	46.2	53.9	61.6	69.3
76	7.6	15.2	22.8	30.4	38.0	45.6	53.2	60.8	68.4
75	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0	67.5
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6

No. 585 L. 767.] [No. 629 L. 799.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
585	767156	7230	7304	7379	7453	7527	7601	7675	7749	7823	
6	7898	7972	8046	8120	8194	8268	8342	8416	8490	8564	74
7	8638	8712	8786	8860	8934	9008	9082	9156	9230	9303	
8	9377	9451	9525	9599	9673	9746	9820	9894	9968		
9	770115	0189	0263	0336	0410	0484	0557	0631	0705	0042 0778	
590	0852	0926	0999	1073	1146	1220	1293	1367	1440	1514	
1	1587	1661	1734	1808	1881	1955	2028	2102	2175	2248	
2	2322	2395	2468	2542	2615	2688	2762	2835	2908	2981	
3	3055	3128	3201	3274	3348	3421	3494	3567	3640	3713	
4	3786	3860	3933	4006	4079	4152	4225	4298	4371	4444	73
5	4517	4590	4663	4736	4809	4882	4955	5028	5100	5173	
6	5246	5319	5392	5465	5538	5610	5683	5756	5829	5902	
7	5974	6047	6120	6193	6265	6338	6411	6483	6556	6629	
8	6701	6774	6846	6919	6992	7064	7137	7209	7282	7354	
9	7427	7499	7572	7644	7717	7789	7862	7934	8006	8079	
600	8151	8224	8296	8368	8441	8513	8585	8658	8730	8802	
1	8874	8947	9019	9091	9163	9236	9308	9380	9452	9524	
2	9596	9669	9741	9813	9885	9957					
3	780317	0389	0461	0533	0605	0677	0029	0101	0173	0245	72
4	1037	1109	1181	1253	1324	1396	0749	0821	0893	0965	
5	1755	1827	1899	1971	2042	2114	1468	1540	1612	1684	
6	2473	2544	2616	2688	2759	2831	2186	2258	2329	2401	
7	3189	3260	3332	3403	3475	3546	2902	2974	3046	3117	
8	3904	3975	4046	4118	4189	4261	3618	3689	3761	3832	
9	4617	4689	4760	4831	4902	4974	4332	4403	4475	4546	
610	5330	5401	5472	5543	5615	5686	5045	5116	5187	5259	
1	6041	6112	6183	6254	6325	6396	5757	5828	5899	5970	
2	6751	6822	6893	6964	7035	7106	6467	6538	6609	6680	71
3	7460	7531	7602	7673	7744	7815	7177	7248	7319	7390	
4	8168	8239	8310	8381	8451	8522	7885	7956	8027	8098	
5	8875	8946	9016	9087	9157	9228	8593	8663	8734	8804	
6	9581	9651	9722	9792	9863	9933	9299	9369	9440	9510	
7	790285	0356	0426	0496	0567	0637	0004	0074	0144	0215	
8	0988	1059	1129	1199	1269	1340	0707	0778	0848	0918	
9	1691	1761	1831	1901	1971	2041	1410	1480	1550	1620	
620	2392	2462	2532	2602	2672	2742	2111	2181	2252	2322	
1	3092	3162	3231	3301	3371	3441	2812	2882	2952	3022	70
2	3790	3860	3930	4000	4070	4139	3511	3581	3651	3721	
3	4488	4558	4627	4697	4767	4836	4209	4279	4349	4418	
4	5185	5254	5324	5393	5463	5532	4906	4976	5045	5115	
5	5880	5949	6019	6088	6158	6227	5602	5672	5741	5811	
6	6574	6644	6713	6782	6852	6921	6297	6366	6436	6505	
7	7268	7337	7406	7475	7545	7614	6990	7060	7129	7198	
8	7960	8029	8098	8167	8236	8305	7683	7752	7821	7890	
9	8651	8720	8789	8858	8927	8996	8374	8443	8513	8582	
							9065	9134	9203	9272	69

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
75	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0	67.5
74	7.4	14.8	22.2	29 6	37.0	44.4	51.8	59.2	66.6
73	7.3	14.6	21.9	29.2	36.5	43.8	51.1	58.4	65.7
72	7.2	14.4	21.6	28.8	36.0	43.2	50.4	57.6	64.8
71	7.1	14.2	21.3	28.4	35.5	42.6	49.7	56.8	63.9
70	7.0	14.0	21.0	28.0	35.0	42.0	49.0	56.0	63.0
69	6.9	13.8	20.7	27.6	34.5	41.4	48.3	55.2	62.1

No. 630 L. 799.] [No. 674 L. 829.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
630	799341	9409	9478	9547	9616	9685	9754	9823	9892	9961	
1	800029	0098	0167	0236	0305	0373	0442	0511	0580	0648	
2	0717	0786	0854	0923	0992	1061	1129	1198	1266	1335	
3	1404	1472	1541	1609	1678	1747	1815	1884	1952	2021	
4	2089	2158	2226	2295	2363	2432	2500	2568	2637	2705	
5	2774	2842	2910	2979	5047	3116	3184	3252	3321	3389	
6	3457	3525	3594	3662	3730	3798	3867	3935	4003	4071	
7	4139	4208	4276	4344	4412	4480	4548	4616	4685	4753	
8	4821	4889	4957	5025	5093	5161	5229	5297	5365	5433	68
9	5501	5569	5637	5705	5773	5841	5908	5976	6044	6112	
640	806180	6248	6316	6384	6451	6519	6587	6655	6723	6790	
1	6858	6926	6994	7061	7129	7197	7264	7332	7400	7467	
2	7535	7603	7670	7738	7806	7873	7941	8008	8076	8143	
3	8211	8279	8346	8414	8481	8549	8616	8684	8751	8818	
4	8886	8953	9021	9088	9156	9223	9290	9358	9425	9492	
5	9560	9627	9694	9762	9829	9896	9964				
6	810233	0300	0367	0434	0501	0569	0636	0031	0098	0165	
7	0904	0971	1039	1106	1173	1240	1307	0703	0770	0837	
8	1575	1642	1709	1776	1843	1910	1977	1374	1441	1508	67
9	2245	2312	2379	2445	2512	2579	2646	2044	2111	2178	
650	2913	2980	3047	3114	3181	3247	3314	2713	2780	2847	
1	3581	3648	3714	3781	3848	3914	3981	3381	3448	3514	
2	4248	4314	4381	4447	4514	4581	4647	4048	4114	4181	
3	4913	4980	5046	5113	5179	5246	5312	4714	4780	4847	
4	5578	5644	5711	5777	5843	5910	5976	5378	5445	5511	
5	6241	6308	6374	6440	6506	6573	6639	6042	6109	6175	
6	6904	6970	7036	7102	7169	7235	7301	6705	6771	6838	
7	7565	7631	7698	7764	7830	7896	7962	7367	7433	7499	
8	8226	8292	8358	8424	8490	8556	8622	8028	8094	8160	
9	8885	8951	9017	9083	9149	9215	9281	8688	8754	8820	66
660	9544	9610	9676	9741	9807	9873	9939	9346	9412	9478	
1	820201	0267	0333	0399	0464	0530	0595	0004	0070	0136	
2	0858	0924	0989	1055	1120	1186	1251	0661	0727	0792	
3	1514	1579	1645	1710	1775	1841	1906	1317	1382	1448	
4	2168	2233	2299	2364	2430	2495	2560	1972	2037	2103	
5	2822	2887	2952	3018	3083	3148	3213	2626	2691	2756	
6	3474	3539	3605	3670	3735	3800	3865	3279	3344	3409	
7	4126	4191	4256	4321	4386	4451	4516	3930	3996	4061	
8	4776	4841	4906	4971	5036	5101	5166	4581	4646	4711	
9	5426	5491	5556	5621	5686	5751	5815	5231	5296	5361	65
670	6075	6140	6204	6269	6334	6399	6464	5880	5945	6010	
1	6723	6787	6852	6917	6981	7046	7111	6528	6593	6658	
2	7369	7434	7499	7563	7628	7692	7757	7175	7240	7305	
3	8015	8080	8144	8209	8273	8338	8402	7821	7886	7951	
4	8660	8724	8789	8853	8918	8982	9046	8467	8531	8595	
								9111	9175	9239	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
68	6.8	13.6	20.4	27.2	34.0	40.8	47.6	54.4	61.2
67	6.7	13.4	20.1	26.8	33.5	40.2	46.9	53.6	60.3
66	6.6	13.2	19.8	26.4	33.0	39.6	46.2	52.8	59.4
65	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5
64	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6

No. 675 L. 829.] [No. 719 L. 857.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
675	829304	9368	9432	9497	9561	9625	9690	9754	9818	9882	
6	9947										
		0011	0075	0139	0204	0268	0332	0396	0460	0525	
7	830589	0653	0717	0781	0845	0909	0973	1037	1102	1166	
8	1230	1294	1358	1422	1486	1550	1614	1678	1742	1806	64
9	1870	1934	1998	2062	2126	2189	2253	2317	2381	2445	
680	2509	2573	2637	2700	2764	2828	2892	2956	3020	3083	
1	3147	3211	3275	3338	3402	3466	3530	3593	3657	3721	
2	3784	3848	3912	3975	4039	4103	4166	4230	4294	4357	
3	4421	4484	4548	4611	4675	4739	4802	4866	4929	4993	
4	5056	5120	5183	5247	5310	5373	5437	5500	5564	5627	
5	5691	5754	5817	5881	5944	6007	6071	6134	6197	6261	
6	6324	6387	6451	6514	6577	6641	6704	6767	6830	6894	
7	6957	7020	7083	7146	7210	7273	7336	7399	7462	7525	
8	7588	7652	7715	7778	7841	7904	7967	8030	8093	8156	
9	8219	8282	8345	8408	8471	8534	8597	8660	8723	8786	63
690	8849	8912	8975	9038	9101	9164	9227	9289	9352	9415	
1	9478	9541	9604	9667	9729	9792	9855	9918	9981		
										0043	
2	840106	0169	0232	0294	0357	0420	0482	0545	0608	0671	
3	0733	0796	0859	0921	0984	1046	1109	1172	1234	1297	
4	1359	1422	1485	1547	1610	1672	1735	1797	1860	1922	
5	1985	2047	2110	2172	2235	2297	2360	2422	2484	2547	
6	2609	2672	2734	2796	2859	2921	2983	3046	3108	3170	
7	3233	3295	3357	3420	3482	3544	3606	3669	3731	3793	
8	3855	3918	3980	4042	4104	4166	4229	4291	4353	4415	
9	4477	4539	4601	4664	4726	4788	4850	4912	4974	5036	
700	5098	5160	5222	5284	5346	5408	5470	5532	5594	5656	62
1	5718	5780	5842	5904	5966	6028	6090	6151	6213	6275	
2	6337	6399	6461	6523	6585	6646	6708	6770	6832	6894	
3	6955	7017	7079	7141	7202	7264	7326	7388	7449	7511	
4	7573	7634	7696	7758	7819	7881	7943	8004	8066	8128	
5	8189	8251	8312	8374	8435	8497	8559	8620	8682	8743	
6	8805	8866	8928	8989	9051	9112	9174	9235	9297	9358	
7	9419	9481	9542	9604	9665	9726	9788	9849	9911	9972	
8	850033	0095	0156	0217	0279	0340	0401	0462	0524	0585	
9	0646	0707	0769	0830	0891	0952	1014	1075	1136	1197	
710	1258	1320	1381	1442	1503	1564	1625	1686	1747	1809	
1	1870	1931	1992	2053	2114	2175	2236	2297	2358	2419	
2	2480	2541	2602	2663	2724	2785	2846	2907	2968	3029	61
3	3090	3150	3211	3272	3333	3394	3455	3516	3577	3637	
4	3698	3759	3820	3881	3941	4002	4063	4124	4185	4245	
5	4306	4367	4428	4488	4549	4610	4670	4731	4792	4852	
6	4913	4974	5034	5095	5156	5216	5277	5337	5398	5459	
7	5519	5580	5640	5701	5761	5822	5882	5943	6003	6064	
8	6124	6185	6245	6306	6366	6427	6487	6548	6608	6668	
9	6729	6789	6850	6910	6970	7031	7091	7152	7212	7272	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
65	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5
64	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6
63	6.3	12.6	18.9	25.2	31.5	37.8	44.1	50.4	56.7
62	6.2	12.4	18.6	24.8	31.0	37.2	43.4	49.6	55.8
61	6.1	12.2	18.3	24.4	30.5	36.6	42.7	48.8	54.9
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0

No. 720 L. 857.] [No. 764 L. 883.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
720	857332	7393	7453	7513	7574	7634	7694	7755	7815	7875	
1	7935	7995	8056	8116	8176	8236	8297	8357	8417	8477	
2	8537	8597	8657	8718	8778	8838	8898	8958	9018	9078	
3	9138	9198	9258	9318	9379	9439	9499	9559	9619	9679	60
4	9739	9799	9859	9918	9978						
						0038	0098	0158	0218	0278	
5	860338	0398	0458	0518	0578	0637	0697	0757	0817	0877	
6	0937	0996	1056	1116	1176	1236	1295	1355	1415	1475	
7	1534	1594	1654	1714	1773	1833	1893	1952	2012	2072	
8	2131	2191	2251	2310	2370	2430	2489	2549	2608	2668	
9	2728	2787	2847	2906	2966	3025	3085	3144	3204	3263	
730	3323	3382	3442	3501	3561	3620	3680	3739	3799	3858	
1	3917	3977	4036	4096	4155	4214	4274	4333	4392	4452	
2	4511	4570	4630	4689	4748	4808	4867	4926	4985	5045	
3	5104	5163	5222	5282	5341	5400	5459	5519	5578	5637	
4	5696	5755	5814	5874	5933	5992	6051	6110	6169	6228	
5	6287	6346	6405	6465	6524	6583	6642	6701	6760	6819	
6	6878	6937	6996	7055	7114	7173	7232	7291	7350	7409	59
7	7467	7526	7585	7644	7703	7762	7821	7880	7939	7998	
8	8056	8115	8174	8233	8292	8350	8409	8468	8527	8586	
9	8644	8703	8762	8821	8879	8938	8997	9056	9114	9173	
740	9232	9290	9349	9408	9466	9525	9584	9642	9701	9760	
1	9818	9877	9935	9994							
					0053	0111	0170	0228	0287	0345	
2	870404	0462	0521	0579	0638	0696	0755	0813	0872	0930	
3	0989	1047	1106	1164	1223	1281	1339	1398	1456	1515	
4	1573	1631	1690	1748	1806	1865	1923	1981	2040	2098	
5	2156	2215	2273	2331	2389	2448	2506	2564	2622	2681	
6	2739	2797	2855	2913	2972	3030	3088	3146	3204	3262	
7	3321	3379	3437	3495	3553	3611	3669	3727	3785	3844	
8	3902	3960	4018	4076	4134	4192	4250	4308	4366	4424	58
9	4482	4540	4598	4656	4714	4772	4830	4888	4945	5003	
750	5061	5119	5177	5235	5293	5351	5409	5466	5524	5582	
1	5640	5698	5756	5813	5871	5929	5987	6045	6102	6160	
2	6218	6276	6333	6391	6449	6507	6564	6622	6680	6737	
3	6795	6853	6910	6968	7026	7083	7141	7199	7256	7314	
4	7371	7429	7487	7544	7602	7659	7717	7774	7832	7889	
5	7947	8004	8062	8119	8177	8234	8292	8349	8407	8464	
6	8522	8579	8637	8694	8752	8809	8866	8924	8981	9039	
7	9096	9153	9211	9268	9325	9383	9440	9497	9555	9612	
8	9669	9726	9784	9841	9898	9956					
							0013	0070	0127	0185	
9	880242	0299	0356	0413	0471	0528	0585	0642	0699	0756	
760	0814	0871	0928	0985	1042	1099	1156	1213	1271	1328	
1	1385	1442	1499	1556	1613	1670	1727	1784	1841	1898	
2	1955	2012	2069	2126	2183	2240	2297	2354	2411	2468	57
3	2525	2581	2638	2695	2752	2809	2866	2923	2980	3037	
4	3093	3150	3207	3264	3321	3377	3434	3491	3548	3605	

Proportional Parts.

Diff.	1	2	3	4	5	6	7	8	9
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4

No. 765 L. 883.] [No. 809 L. 908.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
765	883661	3718	3775	3832	3888	3945	4002	4059	4115	4172	
6	4229	4285	4342	4399	4455	4512	4569	4625	4682	4739	
7	4795	4852	4909	4965	5022	5078	5135	5192	5248	5305	
8	5361	5418	5474	5531	5587	5644	5700	5757	5813	5870	
9	5926	5983	6039	6096	6152	6209	6265	6321	6378	6434	
770	6491	6547	6604	6660	6716	6773	6829	6885	6942	6998	
1	7054	7111	7167	7223	7280	7336	7392	7449	7505	7561	
2	7617	7674	7730	7786	7842	7898	7955	8011	8067	8123	
3	8179	8236	8292	8348	8404	8460	8516	8573	8629	8685	
4	8741	8797	8853	8909	8965	9021	9077	9134	9190	9246	
5	9302	9358	9414	9470	9526	9582	9638	9694	9750	9806	56
6	9862	9918	9974								
				0030	0086	0141	0197	0253	0309	0365	
7	890421	0477	0533	0589	0645	0700	0756	0812	0868	0924	
8	0980	1035	1091	1147	1203	1259	1314	1370	1426	1482	
9	1537	1593	1649	1705	1760	1816	1872	1928	1983	2039	
780	2095	2150	2206	2262	2317	2373	2429	2484	2540	2595	
1	2651	2707	2762	2818	2873	2929	2985	3040	3096	3151	
2	3207	3262	3318	3373	3429	3484	3540	3595	3651	3706	
3	3762	3817	3873	3928	3984	4039	4094	4150	4205	4261	
4	4316	4371	4427	4482	4538	4593	4648	4704	4759	4814	
5	4870	4925	4980	5036	5091	5146	5201	5257	5312	5367	
6	5423	5478	5533	5588	5644	5699	5754	5809	5864	5920	
7	5975	6030	6085	6140	6195	6251	6306	6361	6416	6471	
8	6526	6581	6636	6692	6747	6802	6857	6912	6967	7022	
9	7077	7132	7187	7242	7297	7352	7407	7462	7517	7572	55
790	7627	7682	7737	7792	7847	7902	7957	8012	8067	8122	
1	8176	8231	8286	8341	8396	8451	8506	8561	8615	8670	
2	8725	8780	8835	8890	8944	8999	9054	9109	9164	9218	
3	9273	9328	9383	9437	9492	9547	9602	9656	9711	9766	
4	9821	9875	9930	9985							
					0039	0094	0149	0203	0258	0312	
5	900367	0422	0476	0531	0586	0640	0695	0749	0804	0859	
6	0913	0968	1022	1077	1131	1186	1240	1295	1349	1404	
7	1458	1513	1567	1622	1676	1731	1785	1840	1894	1948	
8	2003	2057	2112	2166	2221	2275	2329	2384	2438	2492	
9	2547	2601	2655	2710	2764	2818	2873	2927	2981	3036	
800	3090	3144	3199	3253	3307	3361	3416	3470	3524	3578	
1	3633	3687	3741	3795	3849	3904	3958	4012	4066	4120	
2	4174	4229	4283	4337	4391	4445	4499	4553	4607	4661	
3	4716	4770	4824	4878	4932	4986	5040	5094	5148	5202	
4	5256	5310	5364	5418	5472	5526	5580	5634	5688	5742	54
5	5796	5850	5904	5958	6012	6066	6119	6173	6227	6281	
6	6335	6389	6443	6497	6551	6604	6658	6712	6766	6820	
7	6874	6927	6981	7035	7089	7143	7196	7250	7304	7358	
8	7411	7465	7519	7573	7626	7680	7734	7787	7841	7895	
9	7949	8002	8056	8110	8163	8217	8270	8324	8378	8431	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6

No. 810 L. 908.] [No. 854 L. 931.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
810	908485	8539	8592	8646	8699	8753	8807	8860	8914	8967	
1	9021	9074	9128	9181	9235	9289	9342	9396	9449	9503	
2	9556	9610	9663	9716	9770	9823	9877	9930	9984	0037	
3	910091	0144	0197	0251	0304	0358	0411	0464	0518	0571	
4	0624	0678	0731	0784	0838	0891	0944	0998	1051	1104	
5	1158	1211	1264	1317	1371	1424	1477	1530	1584	1637	
6	1690	1743	1797	1850	1903	1956	2009	2063	2116	2169	
7	2222	2275	2328	2381	2435	2488	2541	2594	2647	2700	
8	2753	2806	2859	2913	2966	3019	3072	3125	3178	3231	
9	3284	3337	3390	3443	3496	3549	3602	3655	3708	3761	53
820	3814	3867	3920	3973	4026	4079	4132	4184	4237	4290	
1	4343	4396	4449	4502	4555	4608	4660	4713	4766	4819	
2	4872	4925	4977	5030	5083	5136	5189	5241	5294	5347	
3	5400	5453	5505	5558	5611	5664	5716	5769	5822	5875	
4	5927	5980	6033	6085	6138	6191	6243	6296	6349	6401	
5	6454	6507	6559	6612	6664	6717	6770	6822	6875	6927	
6	6980	7033	7085	7138	7190	7243	7295	7348	7400	7453	
7	7506	7558	7611	7663	7716	7768	7820	7873	7925	7978	
8	8030	8083	8135	8188	8240	8293	8345	8397	8450	8502	
9	8555	8607	8659	8712	8764	8816	8869	8921	8973	9026	
830	9078	9130	9183	9235	9287	9340	9392	9444	9496	9549	
1	9601	9653	9706	9758	9810	9862	9914	9967	0019	0071	
2	920123	0176	0228	0280	0332	0384	0436	0489	0541	0593	
3	0645	0697	0749	0801	0853	0906	0958	1010	1062	1114	52
4	1166	1218	1270	1322	1374	1426	1478	1530	1582	1634	
5	1686	1738	1790	1842	1894	1946	1998	2050	2102	2154	
6	2206	2258	2310	2362	2414	2466	2518	2570	2622	2674	
7	2725	2777	2829	2881	2933	2985	3037	3089	3140	3192	
8	3244	3296	3348	3399	3451	3503	3555	3607	3658	3710	
9	3762	3814	3865	3917	3969	4021	4072	4124	4176	4228	
840	4279	4331	4383	4434	4486	4538	4589	4641	4693	4744	
1	4796	4848	4899	4951	5003	5054	5106	5157	5209	5261	
2	5312	5364	5415	5467	5518	5570	5621	5673	5725	5776	
3	5828	5879	5931	5982	6034	6085	6137	6188	6240	6291	
4	6342	6394	6445	6497	6548	6600	6651	6702	6754	6805	
5	6857	6908	6959	7011	7062	7114	7165	7216	7268	7319	
6	7370	7422	7473	7524	7576	7627	7678	7730	7781	7832	
7	7883	7935	7986	8037	8088	8140	8191	8242	8293	8345	
8	8396	8447	8498	8549	8601	8652	8703	8754	8805	8857	
9	8908	8959	9010	9061	9112	9163	9215	9266	9317	9368	
850	9419	9470	9521	9572	9623	9674	9725	9776	9827	9879	51
1	9930	9981	6032	0083	0134	0185	0236	0287	0338	0389	
2	930440	0491	0542	0592	0643	0694	0745	0796	0847	0898	
3	0949	1000	1051	1102	1153	1204	1254	1305	1356	1407	
4	1458	1509	1560	1610	1661	1712	1763	1814	1865	1915	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0

No. 855 L. 931.] [No. 899 L. 954.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
855	931966	2017	2068	2118	2169	2220	2271	2322	2372	2423	
6	2474	2524	2575	2626	2677	2727	2778	2829	2879	2930	
7	2981	3031	3082	3133	3183	3234	3285	3335	3386	3437	
8	3487	3538	3589	3639	3690	3740	3791	3841	3892	3943	
9	3993	4044	4094	4145	4195	4246	4296	4347	4397	4448	
860	4498	4549	4599	4650	4700	4751	4801	4852	4902	4953	
1	5003	5054	5104	5154	5205	5255	5306	5356	5406	5457	
2	5507	5558	5608	5658	5709	5759	5809	5860	5910	5960	
3	6011	6061	6111	6162	6212	6262	6313	6363	6413	6463	
4	6514	6564	6614	6665	6715	6765	6815	6865	6916	6966	
5	7016	7066	7116	7167	7217	7267	7317	7367	7418	7468	
6	7518	7568	7618	7668	7718	7769	7819	7869	7919	7969	
7	8019	8069	8119	8169	8219	8269	8320	8370	8420	8470	50
8	8520	8570	8620	8670	8720	8770	8820	8870	8920	8970	
9	9020	9070	9120	9170	9220	9270	9320	9369	9419	9469	
870	9519	9569	9619	9669	9719	9769	9819	9869	9918	9968	
1	940018	0068	0118	0168	0218	0267	0317	0367	0417	0467	
2	0516	0566	0616	0666	0716	0765	0815	0865	0915	0964	
3	1014	1064	1114	1163	1213	1263	1313	1362	1412	1462	
4	1511	1561	1611	1660	1710	1760	1809	1859	1909	1958	
5	2008	2058	2107	2157	2207	2256	2306	2355	2405	2455	
6	2504	2554	2603	2653	2702	2752	2801	2851	2901	2950	
7	3000	3049	3099	3148	3198	3247	3297	3346	3396	3445	
8	3495	3544	3593	3643	3692	3742	3791	3841	3890	3939	
9	3989	4038	4088	4137	4186	4236	4285	4335	4384	4433	
880	4483	4532	4581	4631	4680	4729	4779	4828	4877	4927	
1	4976	5025	5074	5124	5173	5222	5272	5321	5370	5419	
2	5469	5518	5567	5616	5665	5715	5764	5813	5862	5912	
3	5961	6010	6059	6108	6157	6207	6256	6305	6354	6403	
4	6452	6501	6551	6600	6649	6698	6747	6796	6845	6894	
5	6943	6992	7041	7090	7139	7189	7238	7287	7336	7385	
6	7434	7483	7532	7581	7630	7679	7728	7777	7826	7875	49
7	7924	7973	8022	8070	8119	8168	8217	8266	8315	8364	
8	8413	8462	8511	8560	8608	8657	8706	8755	8804	8853	
9	8902	8951	8999	9048	9097	9146	9195	9244	9292	9341	
890	9390	9439	9488	9536	9585	9634	9683	9731	9780	9829	
1	9878	9926	9975	0024	0073	0121	0170	0219	0267	0316	
2	950365	0414	0462	0511	0560	0608	0657	0706	0754	0803	
3	0851	0900	0949	0997	1046	1095	1143	1192	1240	1289	
4	1338	1386	1435	1483	1532	1580	1629	1677	1726	1775	
5	1823	1872	1920	1969	2017	2066	2114	2163	2211	2260	
6	2308	2356	2405	2453	2502	2550	2599	2647	2696	2744	
7	2792	2841	2889	2938	2986	3034	3083	3131	3180	3228	
8	3276	3325	3373	3421	3470	3518	3566	3615	3663	3711	
9	3760	3808	3856	3905	3953	4001	4049	4098	4146	4194	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2

No. 900 L. 954.] [No. 944 L. 975.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
900	954243	4291	4339	4387	4435	4484	4532	4580	4628	4677	
1	4725	4773	4821	4869	4918	4966	5014	5062	5110	5158	
2	5207	5255	5303	5351	5399	5447	5495	5543	5592	5640	
3	5688	5736	5784	5832	5880	5928	5976	6024	6072	6120	
4	6168	6216	6265	6313	6361	6409	6457	6505	6553	6601	
5	6649	6697	6745	6793	6840	6888	6936	6984	7032	7080	48
6	7128	7176	7224	7272	7320	7368	7416	7464	7512	7559	
7	7607	7655	7703	7751	7799	7847	7894	7942	7990	8038	
8	8086	8134	8181	8229	8277	8325	8373	8421	8468	8516	
9	8564	8612	8659	8707	8755	8803	8850	8898	8946	8994	
910	9041	9089	9137	9185	9232	9280	9328	9375	9423	9471	
1	9518	9566	9614	9661	9709	9757	9804	9852	9900	9947	
2	9995										
		0042	0090	0138	0185	0233	0280	0328	0376	0423	
3	960471	0518	0566	0613	0661	0709	0756	0804	0851	0899	
4	0946	0994	1041	1089	1136	1184	1231	1279	1326	1374	
5	1421	1469	1516	1563	1611	1658	1706	1753	1801	1848	
6	1895	1943	1990	2038	2085	2132	2180	2227	2275	2322	
7	2369	2417	2464	2511	2559	2606	2653	2701	2748	2795	
8	2843	2890	2937	2985	3032	3079	3126	3174	3221	3268	
9	3316	3363	3410	3457	3504	3552	3599	3646	3693	3741	
920	3788	3835	3882	3929	3977	4024	4071	4118	4165	4212	
1	4260	4307	4354	4401	4448	4495	4542	4590	4637	4684	
2	4731	4778	4825	4872	4919	4966	5013	5061	5108	5155	
3	5202	5249	5296	5343	5390	5437	5484	5531	5578	5625	
4	5672	5719	5766	5813	5860	5907	5954	6001	6048	6095	47
5	6142	6189	6236	6283	6329	6376	6423	6470	6517	6564	
6	6611	6658	6705	6752	6799	6845	6892	6939	6986	7033	
7	7080	7127	7173	7220	7267	7314	7361	7408	7454	7501	
8	7548	7595	7642	7688	7735	7782	7829	7875	7922	7969	
9	8016	8062	8109	8156	8203	8249	8296	8343	8390	8436	
930	8483	8530	8576	8623	8670	8716	8763	8810	8856	8903	
1	8950	8996	9043	9090	9136	9183	9229	9276	9323	9369	
2	9416	9463	9509	9556	9602	9649	9695	9742	9789	9835	
3	9882	9928	9975								
				0021	0068	0114	0161	0207	0254	0300	
4	970347	0393	0440	0486	0533	0579	0626	0672	0719	0765	
5	0812	0858	0904	0951	0997	1044	1090	1137	1183	1229	
6	1276	1322	1369	1415	1461	1508	1554	1601	1647	1693	
7	1740	1786	1832	1879	1925	1971	2018	2064	2110	2157	
8	2203	2249	2295	2342	2388	2434	2481	2527	2573	2619	
9	2666	2712	2758	2804	2851	2897	2943	2989	3035	3082	
940	3128	3174	3220	3266	3313	3359	3405	3451	3497	3543	
1	3590	3636	3682	3728	3774	3820	3866	3913	3959	4005	
2	4051	4097	4143	4189	4235	4281	4327	4374	4420	4466	
3	4512	4558	4604	4650	4696	4742	4788	4834	4880	4926	
4	4972	5018	5064	5110	5156	5202	5248	5294	5340	5386	46

Proportional Parts.

Diff.	1	2	3	4	5	6	7	8	9
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4

No 945 L. 975.] [No. 989 L. 995.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
945	975432	5478	5524	5570	5616	5662	5707	5753	5799	5845	
6	5891	5937	5983	6029	6075	6121	6167	6212	6258	6304	
7	6350	6396	6442	6488	6533	6579	6625	6671	6717	6763	
8	6808	6854	6900	6946	6992	7037	7083	7129	7175	7220	
9	7266	7312	7358	7403	7449	7495	7541	7586	7632	7678	
950	7724	7769	7815	7861	7906	7952	7998	8043	8089	8135	
1	8181	8226	8272	8317	8363	8409	8454	8500	8546	8591	
2	8637	8683	8728	8774	8819	8865	8911	8956	9002	9047	
3	9093	9138	9184	9230	9275	9321	9366	9412	9457	9503	
4	9548	9594	9639	9685	9730	9776	9821	9867	9912	9958	
5	980003	0049	0094	0140	0185	0231	0276	0322	0367	0412	
6	0458	0503	0549	0594	0640	0685	0730	0776	0821	0867	
7	0912	0957	1003	1048	1093	1139	1184	1229	1275	1320	
8	1366	1411	1456	1501	1547	1592	1637	1683	1728	1773	
9	1819	1864	1909	1954	2000	2045	2090	2135	2181	2226	
960	2271	2316	2362	2407	2452	2497	2543	2588	2633	2678	
1	2723	2769	2814	2859	2904	2949	2994	3040	3085	3130	
2	3175	3220	3265	3310	3356	3401	3446	3491	3536	3581	
3	3626	3671	3716	3762	3807	3852	3897	3942	3987	4032	
4	4077	4122	4167	4212	4257	4302	4347	4392	4437	4482	
5	4527	4572	4617	4662	4707	4752	4797	4842	4887	4932	45
6	4977	5022	5067	5112	5157	5202	5247	5292	5337	5382	
7	5426	5471	5516	5561	5606	5651	5696	5741	5786	5830	
8	5875	5920	5965	6010	6055	6100	6144	6189	6234	6279	
9	6324	6369	6413	6458	6503	6548	6593	6637	6682	6727	
970	6772	6817	6861	6906	6951	6996	7040	7085	7130	7175	
1	7219	7264	7309	7353	7398	7443	7488	7532	7577	7622	
2	7666	7711	7756	7800	7845	7890	7934	7979	8024	8068	
3	8113	8157	8202	8247	8291	8336	8381	8425	8470	8514	
4	8559	8604	8648	8693	8737	8782	8826	8871	8916	8960	
5	9005	9049	9094	9138	9183	9227	9272	9316	9361	9405	
6	9450	9494	9539	9583	9628	9672	9717	9761	9806	9850	
7	9895	9939	9983								
				0028	0072	0117	0161	0206	0250	0294	
8	990339	0383	0428	0472	0516	0561	0605	0650	0694	0738	
9	0783	0827	0871	0916	0960	1004	1049	1093	1137	1182	
980	1226	1270	1315	1359	1403	1448	1492	1536	1580	1625	
1	1669	1713	1758	1802	1846	1890	1935	1979	2023	2067	
2	2111	2156	2200	2244	2288	2333	2377	2421	2465	2509	
3	2554	2598	2642	2686	2730	2774	2819	2863	2907	2951	
4	2995	3039	3083	3127	3172	3216	3260	3304	3348	3392	
5	3436	3480	3524	3568	3613	3657	3701	3745	3789	3833	
6	3877	3921	3965	4009	4053	4097	4141	4185	4229	4273	
7	4317	4361	4405	4449	4493	4537	4581	4625	4669	4713	44
8	4757	4801	4845	4889	4933	4977	5021	5065	5108	5152	
9	5196	5240	5284	5328	5372	5416	5460	5504	5547	5591	

PROPORTIONAL PARTS.

Diff.	1	2	3	4	5	6	7	8	9
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7

TABLE 10.—LOGARITHMS OF NUMBERS.

No. 990 L. 995.] [No. 999 L. 999.

N.	0	1	2	3	4	5	6	7	8	9	Diff.
990	995635	5679	5723	5767	5811	5854	5898	5942	5986	6030	
1	6074	6117	6161	6205	6249	6293	6337	6380	6424	6468	44
2	6512	6555	6599	6643	6687	6731	6774	6818	6862	6906	
3	6949	6993	7037	7080	7124	7168	7212	7255	7299	7343	
4	7386	7430	7474	7517	7561	7605	7648	7692	7736	7779	
5	7823	7867	7910	7954	7998	8041	8085	8129	8172	8216	
6	8259	8303	8347	8390	8434	8477	8521	8564	8608	8652	
7	8695	8739	8782	8826	8869	8913	8956	9000	9043	9087	
8	9131	9174	9218	9261	9305	9348	9392	9435	9479	9522	
9	9565	9609	9652	9696	9739	9783	9826	9870	9913	9957	43

TABLE 11.—CONVERGENCY OF MERIDIANS, SIX MILES LONG AND SIX MILES APART, AND DIFFERENCES OF LATITUDE AND LONGITUDE.

Lat.	Convergency.		Difference of longitude per range.		Difference of latitude for—	
	On the parallel.	Angle.	In arc.	In time.	1 mi.	1 Tp.
°	*Lks.*	′ ″	′ ″	*Seconds.*		
25	33.9	2 25	5 44.34	22.96		
26	35.4	2 32	5 47.20	23.15		
27	37.0	2 39	5 50.22	23.35	0.871	5.229
28	38.6	2 46	5 53.40	23.56		
29	40.2	2 53	5 56.74	23.78		
30	41.9	3 0	6 0.26	24.02		
31	43.6	3 7	6 3.97	24.26		
32	45.4	3 15	6 7.87	24.52	0.871	5.225
33	47.2	3 23	6 11.96	24.80		
34	49.1	3 30	6 16.26	25.08		
35	50.9	3 38	6 20.78	25.39		
36	52.7	3 46	6 25.53	25.70		
37	54.7	3 55	6 30.52	26.03	0.870	5.221
38	56.8	4 4	6 35.76	26.38		
39	58.8	4 13	6 41.27	26.75		
40	60.9	4 22	6 47.06	27.14		
41	63.1	4 31	6 53.15	27.54		
42	65.4	4 41	6 59.56	27.97	0.869	5.216
43	67.7	4 51	7 6.29	28.42		
44	70.1	5 1	7 13.39	28.89		
45	72.6	5 12	7 20.86	29.39		
46	75.2	5 23	7 28.74	29.92		
47	77.8	5 34	7 37.04	30.47	0.869	5.211
48	80.6	5 46	7 45.80	31.05	52.1	5 12.6
49	83.5	5 59	7 55.05	31.67		
50	86.4	6 12	8 4.83	32.32		
51	89.6	6 25	8 15.17	33.03		
52	92.8	6 39	8 26.13	33.74	0.868	5.207
53	96.2	6 54	8 37.75	34.52		
54	99.8	7 9	8 50.07	35.34		
55	103.5	7 25	9 3.18	36.22		
56	107.5	7 42	9 17.12	37.14		
57	111.6	8 0	9 31.97	38.13	0.867	5.202
58	116.0	8 19	9 47.83	39.19		
59	120.6	8 38	10 4.78	40.32		
60	125.5	8 59	10 22.94	41.52		
61	130.8	9 22	10 42.42	42.83		
62	136.3	9 46	11 3.38	44.22	0.866	5.198
63	142.2	10 11	11 25.97	45.73		
64	148.6	10 38	11 50.37	47.36		
65	155.0	11 8	12 16.82	49.12		
66	162.8	11 39	12 45.55	51.04		
67	170.7	12 13	13 16.88	53.12	0.866	5.195
68	179.3	12 51	13 51.15	55.41		
69	188.7	13 31	14 28.77	57.92		
70	199.1	14 15	15 10.26	60.68	0.866	5.193

TABLE 12.—AZIMUTHS OF THE TANGENT TO THE PARALLEL.

Lat.	1 mi.	2 mi.	3 mi.	4 mi.	5 mi.	6 mi.
°	° ′	° ′	° ′	° ′	° ′	° ′
25	89 59.6	89 59.2	89 58.8	89 58.4	89 58.0	89 57.6
26	59.6	59.2	58.7	58.3	57.9	57.5
27	59.6	59.1	58.7	58.2	57.8	57.4
28	59.5	59.1	58.6	58.2	57.7	57.2
29	59.5	59.0	58.6	58.1	57.6	57.1
30	59.5	59.0	58.5	58.0	57.5	57.0
31	59.5	59.0	58.4	57.9	57.4	56.9
32	59.5	58.9	58.4	57.8	57.3	56.8
33	59.4	58.9	58.3	57.7	57.2	56.6
34	59.4	58.8	58.2	57.7	57.1	56.5
35	59.4	58.8	58.2	57.6	57.0	56.4
36	59.4	58.7	58.1	57.5	56.9	56.2
37	59.3	58.7	58.0	57.4	56.7	56.1
38	59.3	58.6	58.0	57.3	56.6	55.9
39	59.3	58.6	57.9	57.2	56.5	55.8
40	59.3	58.5	57.8	57.1	56.4	55.6
41	59.2	58.5	57.7	57.0	56.2	55.5
42	59.2	58.4	57.7	56.9	56.1	55.3
43	59.2	58.4	57.6	56.8	56.0	55.2
44	59.2	58.3	57.5	56.7	55.8	55.0
45	59.1	58.3	57.4	56.5	55.7	54.8
46	59.1	58.2	57.3	56.4	55.5	54.6
47	59.1	58.1	57.2	56.3	55.4	54.4
48	59.0	58.1	57.1	56.2	55.2	54.2
49	59.0	58.0	57.0	56.0	55.0	54.0
50	59.0	57.9	56.9	55.9	54.8	53.8
51	58.9	57.9	56.8	55.7	54.6	53.6
52	58.9	57.8	56.7	55.6	54.5	53.4
53	58.8	57.7	56.6	55.4	54.2	53.1
54	58.8	57.6	56.4	55.2	54.0	52.8
55	58.8	57.5	56.3	55.1	53.8	52.6
56	58.7	57.4	56.2	54.9	53.6	52.3
57	58.7	57.3	56.0	54.7	53.3	52.0
58	58.6	57.2	55.8	54.5	53.1	51.7
59	58.6	57.1	55.7	54.2	52.8	51.4
60	58.5	57.0	55.5	54.0	52.5	51.0
61	58.4	56.9	55.3	53.8	52.2	50.6
62	58.4	56.7	55.1	53.5	51.9	50.2
63	58.3	56.6	54.9	53.2	51.5	49.8
64	58.2	56.5	54.7	52.9	51.1	49.4
65	58.1	56.3	54.4	52.6	50.7	48.9
66	58.1	56.1	54.2	52.2	50.3	48.4
67	58.0	55.9	53.9	51.8	49.8	47.8
68	57.9	55.7	53.6	51.4	49.3	47.2
69	57.8	55.5	53.2	51.0	48.8	46.5
70	89 57.6	89 55.3	89 52.9	89 50.5	89 48.1	89 45.8

TABLE 13.—OFFSETS, IN LINKS, FROM THE TANGENT TO THE PARALLEL.

Lat.	½ mi.	1 mi.	1½ mi.	2 mi.	2½ mi.	3 mi.	3½ mi.	4 mi.	4½ mi.	5 mi.	5½ mi.	6 mi.
°												
25	0	0	1	2	3	4	6	8	10	12	14	17
26	0	0	1	2	3	4	6	8	10	12	15	18
27	0	1	1	2	3	5	6	8	10	13	16	18
28	0	1	1	2	3	5	7	9	11	13	16	19
29	0	1	1	2	3	5	7	9	11	14	17	20
30	0	1	1	2	4	5	7	9	12	15	18	21
31	0	1	1	2	4	5	7	10	12	15	18	22
32	0	1	1	3	4	6	8	10	13	16	19	23
33	0	1	1	3	4	6	8	10	13	16	20	24
34	0	1	2	3	4	6	8	11	14	17	21	25
35	0	1	2	3	4	6	8	11	14	18	21	25
36	0	1	2	3	5	7	9	12	15	18	22	26
37	0	1	2	3	5	7	9	12	15	19	23	27
38	0	1	2	3	5	7	10	13	16	20	24	28
39	0	1	2	3	5	7	10	13	17	20	25	29
40	0	1	2	3	5	8	10	14	17	21	26	30
41	0	1	2	4	5	8	11	14	18	22	27	32
42	0	1	2	4	6	8	11	15	18	23	27	33
43	0	1	2	4	6	8	11	15	19	24	28	34
44	0	1	2	4	6	9	12	16	20	24	29	35
45	0	1	2	4	6	9	12	16	20	25	30	36
46	0	1	2	4	7	9	13	17	21	26	32	38
47	0	1	2	4	7	10	13	17	22	27	33	39
48	0	1	3	4	7	10	14	18	23	28	34	40
49	0	1	3	5	7	10	14	19	23	29	35	42
50	0	1	3	5	8	11	15	19	24	30	36	43
51	0	1	3	5	8	11	15	20	25	31	38	45
52	0	1	3	5	8	12	16	21	26	32	39	46
53	0	1	3	5	8	12	16	21	27	33	40	48
54	0	1	3	6	9	12	17	22	28	35	42	50
55	0	1	3	6	9	13	18	23	29	36	43	52
56	0	1	3	6	9	13	18	24	30	37	45	54
57	0	2	3	6	10	14	19	25	31	39	47	56
58	0	2	4	6	10	14	20	26	33	40	49	58
59	0	2	4	7	10	15	20	27	34	42	51	60
60	0	2	4	7	11	16	21	28	35	44	53	63
61	0	2	4	7	11	16	22	29	37	45	55	65
62	0	2	4	8	12	17	23	30	38	47	57	68
63	0	2	4	8	12	18	24	32	40	49	60	71
64	1	2	5	8	13	19	25	33	42	52	62	74
65	1	2	5	9	13	19	26	34	44	54	65	78
66	1	2	5	9	14	20	28	36	46	57	68	81
67	1	2	5	9	15	21	29	38	48	59	72	85
68	1	2	6	10	16	22	30	40	50	62	75	90
69	1	3	6	10	16	24	32	42	53	66	79	94
70	**1**	**3**	**6**	**11**	**17**	**25**	**34**	**44**	**56**	**69**	**84**	**100**

TABLE 14.—AZIMUTHS OF THE SECANT.

Lat.	0 mi.	1 mi.	2 mi.	3 mi.	Deflection angle 6 mi.
°	° ′	° ′	° ′		′ ″
25	89 58.8	89 59.2	89 59.6	90°	2 25
26	58.7	59.2	59.6	E or W.	2 32
27	58.7	59.1	59.6	" " "	2 39
28	58.6	59.1	59.5	" " "	2 46
29	58.6	59.0	59.5	" " "	2 53
30	58.5	59.0	59.5	" " "	3 0
31	58.4	59.0	59.5	" " "	3 7
32	58.4	58.9	59.5	" " "	3 15
33	58.3	58.9	59.4	" " "	3 23
34	58.2	58.8	59.4	" " "	3 30
35	58.2	58.8	59.4	" " "	3 38
36	58.1	58.7	59.4	" " "	3 46
37	58.0	58.7	59.3	" " "	3 55
38	58.0	58.6	59.3	" " "	4 4
39	57.9	58.6	59.3	" " "	4 13
40	57.8	58.5	59.3	" " "	4 22
41	57.7	58.5	59.2	" " "	4 31
42	57.7	58.4	59.2	" " "	4 41
43	57.6	58.4	59.2	" " "	4 51
44	57.5	58.3	59.2	" " "	5 1
45	57.4	58.3	59.1	" " "	5 12
46	57.3	58.2	59.1	" " "	5 23
47	57.2	58.1	59.1	" " "	5 34
48	57.1	58.1	59.0	" " "	5 46
49	57.0	58.0	59.0	" " "	5 59
50	56.9	57.9	59.0	" " "	6 12
51	56.8	57.9	58.9	" " "	6 25
52	56.7	57.8	58.9	" " "	6 39
53	56.6	57.7	58.8	" " "	6 54
54	56.4	57.6	58.8	" " "	7 9
55	56.3	57.5	58.8	" " "	7 25
56	56.2	57.4	58.7	" " "	7 42
57	56.0	57.3	58.7	" " "	8 0
58	55.8	57.2	58.6	" " "	8 19
59	55.7	57.1	58.6	" " "	8 38
60	55.5	57.0	58.5	" " "	8 59
61	55.3	56.9	58.4	" " "	9 22
62	55.1	56.7	58.4	" " "	9 46
63	54.9	56.6	58.3	" " "	10 11
64	54.7	56.5	58.2	" " "	10 38
65	54.4	56.3	58.1	" " "	11 8
66	54.2	56.1	58.1	" " "	11 39
67	53.9	55.9	58.0	" " "	12 13
68	53.6	55.7	57.9	" " "	12 51
69	53.2	55.5	57.8	" " "	13 31
70	89 52.9	89 55.3	89 57.6	" " "	14 15
	6 mi.	5 mi.	4 mi.	3 mi.	

TABLE 15.—OFFSETS, IN LINKS, FROM THE SECANT TO THE PARALLEL.

Lat.	0 mi.	½ mi.	1 mi.	1½ mi.	2 mi.	2½ mi.	3 mi.
°							
25	2 N.	1 N.	0	1 S.	1 S.	2 S.	2 S.
26	2	1	0	1	1	2	2
27	3	1	0	1	2	2	2
28	3	1	0	1	2	2	2
29	3	1	0	1	2	2	2
30	3	1	0	1	2	2	2
31	3	1	0	1	2	2	2
32	3	1	0	1	2	2	3
33	3	1	0	1	2	2	3
34	3	2	0	1	2	3	3
35	4	2	0	1	2	3	3
36	4	2	0	1	2	3	3
37	4	2	0	1	2	3	3
38	4	2	0	1	2	3	3
39	4	2	0	1	2	3	3
40	4	2	0	1	3	3	3
41	4	2	0	2	3	3	4
42	5	2	0	2	3	3	4
43	5	2	0	2	3	4	4
44	5	2	0	2	3	4	4
45	5	2	0	2	3	4	4
46	5	2	0	2	3	4	4
47	5	2	0	2	3	4	4
48	6	3	0	2	3	4	4
49	6	3	0	2	3	4	5
50	6	3	0	2	4	4	5
51	6	3	0	2	4	5	5
52	6	3	0	2	4	5	5
53	7	3	0	2	4	5	5
54	7	3	0	2	4	5	6
55	7	3	0	3	4	5	6
56	7	3	0	3	4	6	6
57	8	3	0	3	5	6	6
58	8	4	0	3	5	6	6
59	8	4	0	3	5	6	7
60	9	4	0	3	5	7	7
61	9	4	0	3	5	7	7
62	9	4	0	3	6	7	8
63	10	4	0	3	6	7	8
64	10	5	0	4	6	8	8
65	11	5	0	4	6	8	9
66	11	5	0	4	7	8	9
67	12	5	0	4	7	9	9
68	12	6	0	4	7	9	10
69	13	6	0	5	8	10	10
70	14 N.	6 N.	0	5 S.	8 S.	10 S.	11 S.
	6 mi.	5½ mi.	5 mi.	4½ mi.	4 mi.	3½ mi.	3 mi.

TABLE 16.—LENGTHS OF ARCS OF THE EARTH'S SURFACE.

Lengths of degrees of the parallel.				Lengths of degrees of the meridian.	
Lat.	Statute miles.	Lat.	Statute miles.	Lat.	Statute miles.
° ′		° ′		°	
25 0	62.729	47 30	46.818	25	68.829
30	62.473	48 0	46.372	26	68.839
26 0	62.212	30	45.922	27	68.848
30	61.946	49 0	45.469	28	68.858
27 0	61.676	30	45.012	29	68.869
30	61.401	50 0	44.552	30	68.879
28 0	61.122	30	44.088	31	68.890
30	60.837	51 0	43.621	32	68.901
29 0	60.548	30	43.150	33	68.912
30	60.254	52 0	42.676	34	68.923
30 0	59.956	30	42.199	35	68.935
30	59.653	53 0	41.719	36	68.946
31 0	59.345	30	41.235	37	68.958
30	59.033	54 0	40.749	38	68.969
32 0	58.716	30	40.259	39	68.981
30	58.396	55 0	39.766	40	68.993
33 0	58.071	30	39.270	41	69.006
30	57.741	56 0	38.771	42	69.018
34 0	57.407	30	38.269	43	69.030
30	57.068	57 0	37.764	44	69.042
35 0	56.725	30	37.256	45	69.054
30	56.378	58 0	36.745	46	69.066
36 0	56.027	30	36.232	47	69.079
30	55.671	59 0	35.716	48	69.091
37 0	55.311	30	35.196	49	69.103
30	54.947	60 0	34.674	50	69.115
38 0	54.579	30	34.150	51	69.127
30	54.206	61 0	33.623	52	69.139
39 0	53.829	30	33.093	53	69.151
30	53.448	62 0	32.560	54	69.163
40 0	53.063	30	32.025	55	69.175
30	52.674	63 0	31.488	56	69.186
41 0	52.281	30	30.948	57	69.197
30	51.884	64 0	30.406	58	69.209
42 0	51.483	30	29.862	59	69.220
30	51.078	65 0	29.315	60	69.230
43 0	50.669	30	28.766	61	69.241
30	50.257	66 0	28.215	62	69.251
44 0	49.840	30	27.661	63	69.261
30	49.419	67 0	27.106	64	69.271
45 0	48.995	30	26.548	65	69.281
30	48.567	68 0	25.988	66	69.290
46 0	48.136	30	25.426	67	69.299
30	47.700	69 0	24.862	68	69.308
47 0	47.261	30	24.297	69	69.316
47 30	46.818	70 0	23.729	70	69.324

The lengths of degrees of the meridian are tabulated to correspond to the length of the arc of which the tabulated latitude is the middle, thus the quantity 68.993, opposite latitude 40° 0′ is the number of miles between latitude 39° 30′ and 40° 30′.

The above table is an abridgment of a table published by the U. S. Coast and Geodetic Survey based on the values of the Clarke spheroid.

TABLE 17.—APPARENT TIME OF SUNSET FOR N. DECLINATIONS, OR SUNRISE FOR S. DECLINATIONS.

Sun's Decl.	Latitude.				
	25°	30°	35°	40°	45°
° ′	h m	h m	h m	h m	h m
0 0	6 0	6 0	6 0	6 0	6 0
1	6 2	6 2	6 3	6 3	6 4
2	6 4	6 5	6 6	6 7	6 8
3	6 6	6 7	6 8	6 10	6 12
4	6 7	6 9	6 11	6 13	6 16
5	6 9	6 12	6 14	6 17	6 20
6	6 11	6 14	6 17	6 20	6 24
7	6 13	6 16	6 20	6 24	6 28
8	6 15	6 19	6 23	6 27	6 32
9	6 17	6 21	6 25	6 31	6 36
10	6 19	6 23	6 28	6 34	6 41
11	6 21	6 26	6 31	6 38	6 45
12	6 23	6 28	6 34	6 41	6 49
13	6 25	6 31	6 37	6 45	6 53
14	6 27	6 33	6 40	6 48	6 58
15	6 29	6 36	6 43	6 52	7 2
16	6 31	6 38	6 46	6 56	7 7
17	6 33	6 41	6 49	6 59	7 11
18	6 35	6 43	6 53	7 3	7 16
19	6 37	6 46	6 56	7 7	7 21
20	6 39	6 49	6 59	7 11	7 25
21	6 41	6 51	7 2	7 15	7 30
22	6 43	6 54	7 6	7 19	7 35
23	6 46	6 57	7 9	7 23	7 40
23 27	6 47	6 58	7 11	7 25	7 43

Sun's Decl.	Latitude.				
	50°	55°	60°	65°	70°
° ′	h m	h m	h m	h m	h m
0 0	6 0	6 0	6 0	6 0	6 0
1	6 5	6 6	6 7	6 9	6 11
2	6 10	6 11	6 14	6 17	6 22
3	6 14	6 17	6 21	6 26	6 33
4	6 19	6 23	6 28	6 34	6 44
5	6 24	6 29	6 35	6 42	6 56
6	6 29	6 35	6 42	6 52	7 7
7	6 34	6 40	6 49	7 0	7 19
8	6 39	6 46	6 56	7 10	7 31
9	6 44	6 52	7 4	7 19	7 43
10	6 49	6 58	7 11	7 29	7 56
11	6 54	7 4	7 19	7 39	8 9
12	6 59	7 11	7 26	7 48	8 23
13	7 4	7 17	7 34	7 59	8 37
14	7 9	7 23	7 42	8 9	8 53
15	7 14	7 30	7 51	8 20	9 10
16	7 20	7 37	7 59	8 32	9 28
17	7 25	7 44	8 8	8 44	9 48
18	7 31	7 51	8 17	8 57	10 13
19	7 37	7 58	8 26	9 10	10 44
20	7 43	8 5	8 36	9 25	12 00
21	7 49	8 13	8 47	9 42	
22	7 55	8 21	8 58	10 0	
23	8 2	8 29	9 9	10 22	
23 27	8 5	8 33	9 15	10 34	

TABLE 18.—CONVERSION OF DEGREES TO TIME, AND TIME TO DEGREES.

To reduce degrees to time.						To reduce time to degrees.					
°	H. M.	°	H. M.	Degrees.	Hours. Minutes.	Hours.	Degrees.	M.	° ′	M.	° ′
′	M. S.	′	M. S.					S.	′ ″	S.	′ ″
″	S. T.	″	S. T.					T.	″ ‴	T.	″ ‴
1	0 4	51	3 24	101	6 44	1	15	1	0 15	51	12 45
2	0 8	52	3 28	102	6 48	1½	22½	2	0 30	52	13 0
3	0 12	53	3 32	103	6 52	2	30	3	0 45	53	13 15
4	0 16	54	3 36	104	6 56	2½	37½	4	1 0	54	13 30
5	0 20	55	3 40	105	7 0	3	45	5	1 15	55	13 45
6	0 24	56	3 44	106	7 4	3½	52½	6	1 30	56	14 0
7	0 28	57	3 48	107	7 8	4	60	7	1 45	57	14 15
8	0 32	58	3 52	108	7 12	4½	67½	8	2 0	58	14 30
9	0 36	59	3 56	109	7 16	5	75	9	2 15	59	14 45
10	0 40	60	4 0	110	7 20	5½	82½	10	2 30	60	15 0
11	0 44	61	4 4	115	7 40	6	90	11	2 45	61	15 15
12	0 48	62	4 8	120	8 0	6½	97½	12	3 0	62	15 30
13	0 52	63	4 12	125	8 20	7	105	13	3 15	63	15 45
14	0 56	64	4 16	130	8 40	7½	112½	14	3 30	64	16 0
15	1 0	65	4 20	135	9 0	8	120	15	3 45	65	16 15
16	1 4	66	4 24	140	9 20	8½	127½	16	4 0	66	16 30
17	1 8	67	4 28	145	9 40	9	135	17	4 15	67	16 45
18	1 12	68	4 32	150	10 0	9½	142½	18	4 30	68	17 0
19	1 16	69	4 36	155	10 20	10	150	19	4 45	69	17 15
20	1 20	70	4 40	160	10 40	10½	157½	20	5 0	70	17 30
21	1 24	71	4 44	165	11 0	11	165	21	5 15	71	17 45
22	1 28	72	4 48	170	11 20	11½	172½	22	5 30	72	18 0
23	1 32	73	4 52	175	11 40	12	180	23	5 45	73	18 15
24	1 36	74	4 56	180	12 0	12½	187½	24	6 0	74	18 30
25	1 40	75	5 0	185	12 20	13	195	25	6 15	75	18 45
26	1 44	76	5 4	190	12 40	13½	202½	26	6 30	76	19 0
27	1 48	77	5 8	195	13 0	14	210	27	6 45	77	19 15
28	1 52	78	5 12	200	13 20	14½	217½	28	7 0	78	19 30
29	1 56	79	5 16	205	13 40	15	225	29	7 15	79	19 45
30	2 0	80	5 20	210	14 0	15½	232½	30	7 30	80	20 0
31	2 4	81	5 24	215	14 20	16	240	31	7 45	81	20 15
32	2 8	82	5 28	220	14 40	16½	247½	32	8 0	82	20 30
33	2 12	83	5 32	225	15 0	17	255	33	8 15	83	20 45
34	2 16	84	5 36	230	15 20	17½	262½	34	8 30	84	21 0
35	2 20	85	5 40	235	15 40	18	270	35	8 45	85	21 15
36	2 24	86	5 44	240	16 0	18½	277½	36	9 0	86	21 30
37	2 28	87	5 48	245	16 20	19	285	37	9 15	87	21 45
38	2 32	88	5 52	250	16 40	19½	292½	38	9 30	88	22 0
39	2 36	89	5 56	255	17 0	20	300	39	9 45	89	22 15
40	2 40	90	6 0	260	17 20	20½	307½	40	10 0	90	22 30
41	2 44	91	6 4	270	18 0	21	315	41	10 15	91	22 45
42	2 48	92	6 8	280	18 40	21½	322½	42	10 30	92	23 0
43	2 52	93	6 12	290	19 20	22	330	43	10 45	93	23 15
44	2 56	94	6 16	300	20 0	22½	337½	44	11 0	94	23 30
45	3 0	95	6 20	310	20 40	23	345	45	11 15	95	23 45
46	3 4	96	6 24	320	21 20	23½	352½	46	11 30	96	24 0
47	3 8	97	6 28	330	22 0	24	360	47	11 45	97	24 15
48	3 12	98	6 32	340	22 40			48	12 0	98	24 30
49	3 16	99	6 36	350	23 20			49	12 15	99	24 45
50	3 20	100	6 40	360	24 0			50	12 30	100	25 0

TABLE 19.—SIDEREAL CONVERSIONS.

Long.	Hours.	Longitude. 0° 0′	2° 30′	5° 0′	7° 30′	10° 0′	12° 30′	15° 0′
		Minutes. 0	10	20	30	40	50	60
°		m s	m s	m s	m s	m s	m s	m s
0	0	0 0	0 2	0 3	0 5	0 7	0 8	0 10
15	1	0 10	0 11	0 13	0 15	0 16	0 18	0 20
30	2	0 20	0 21	0 23	0 25	0 26	0 28	0 30
45	3	0 30	0 31	0 33	0 34	0 36	0 38	0 39
60	4	0 39	0 41	0 43	0 44	0 46	0 48	0 49
75	5	0 49	0 51	0 53	0 54	0 56	0 57	0 59
90	6	0 59	1 1	1 2	1 4	1 6	1 7	1 9
105	7	1 9	1 11	1 12	1 14	1 15	1 17	1 19
120	8	1 19	1 20	1 22	1 24	1 25	1 27	1 29
135	9	1 29	1 30	1 32	1 34	1 35	1 37	1 38
150	10	1 38	1 40	1 42	1 43	1 45	1 47	1 48
165	11	1 48	1 50	1 52	1 53	1 55	1 56	1 58
180	12	1 58	2 0	2 1	2 3	2 5	2 6	2 8
195	13	2 8	2 10	2 11	2 13	2 15	2 16	2 18
210	14	2 18	2 19	2 21	2 23	2 24	2 26	2 28
225	15	2 28	2 29	2 31	2 33	2 34	2 36	2 37
240	16	2 37	2 39	2 41	2 42	2 44	2 46	2 47
255	17	2 47	2 49	2 51	2 52	2 54	2 56	2 57
270	18	2 57	2 59	3 0	3 2	3 4	3 5	3 7
285	19	3 7	3 9	3 10	3 12	3 14	3 15	3 17
300	20	3 17	3 18	3 20	3 22	3 23	3 25	3 27
315	21	3 27	3 28	3 30	3 32	3 33	3 35	3 37
330	22	3 37	3 38	3 40	3 41	3 43	3 45	3 46
345	23	3 46	3 48	3 50	3 51	3 53	3 55	3 56
	Hours.							

Sidereal into mean solar time: To be subtracted from a sidereal time interval: Argument hours and minutes of sidereal interval.

Mean Solar into sidereal time: To be added to a mean time interval: Argument hours and minutes of mean time interval.

Upper culmination of Polaris: Amount to be subtracted from the Greenwich mean time of upper culmination of Polaris, or of elongation, to obtain the local mean time of upper culmination, or of elongation: Argument longitude west from Greenwich.

The above table is an abridged mean of two tables given in the American Ephemeris and Nautical Almanac for similar conversions; reductions involving a refinement exceeding 0.8 seconds must be made from the more elaborate tables.

TABLE 20.—MEAN REFRACTIONS IN ZENITH DISTANCE.

Bar.=29.6 Ins. Temp.=50° F.

Apparent altitude.	Refraction.	Apparent altitude.	Refraction.	Apparent altitude.	Refraction.
° ′	′ ″	° ′	′ ″	°	′ ″
7 30	6 53	12 0	4 25	25	2 3
40	45	12 30	15	26	1 58
7 50	37	13 0	4 5	27	53
8 0	30	13 30	3 56	28	48
10	22	14 0	47	29	44
20	15	14 30	39	30	40
30	8	15 0	32	32	32
40	6 2	15 30	25	34	25
8 50	5 55	16 0	19	36	19
9 0	49	16 30	13	38	14
10	43	17 0	7	40	9
20	38	17 30	3 1	42	4
30	32	18 0	2 56	44	1 0
40	26	18 30	51	46	0 56
9 50	21	19 0	46	48	52
10 0	16	19 30	42	50	48
20	5 6	20 0	37	55	40
10 40	4 57	21 0	29	60	33
11 0	48	22 0	22	65	27
20	40	23 0	15	70	21
11 40	32	24 0	9	80	10
12 0	4 25	25 0	2 3	90	0 0

SUN'S PARALLAX IN ALTITUDE.

Apparent altitude.....	0°	26°	48°	63°	77°	90°
Sun's parallax	8″.9	8″	6″	4″	2″	0″

TABLE 21.—COEFFICIENTS TO APPLY TO MEAN REFRACTIONS FOR VARIATIONS IN BAROMETER AND TEMPERATURE.

Barometer.	Elevation above sea level.	Coefficient.	Barometer.	Elevation above sea level.	Coefficient.	Temperature (Fahr.).	Coefficient.
Ins.	*Feet.*		*Ins.*	*Feet.*		°	
30.5	−451	1.03	25.4	4,535	0.86	−24	1.17
30.2	−181	1.02	25.1	4,859	.85	17	1.15
30.0	00	1.01	24.8	5,186	.84	− 9	1.13
29.9	+ 91	1.01	24.5	5,518	.83	0	1.11
29.6	366	1.00	24.2	5,854	.82	+ 8	1.09
29.3	643	.99	23.9	6,194	.81	16	1.07
29.0	924	.98	23.6	6,538	.80	25	1.05
28.7	1,207	.97	23.3	6,887	.79	35	1.03
28.4	1,493	.96	23.0	7,239	.78	40	1.02
28.1	1,783	.95	22.7	7,597	.77	45	1.01
27.8	2,075	.94	22.4	7,960	.76	50	1.00
27.5	2,371	.93	22.1	8,327	.75	55	.99
27.2	2,670	.92	21.8	8,700	.74	60	.98
26.9	2,972	.91	21.5	9,077	.73	66	.97
26.6	3,277	.90	21.2	9,460	.72	77	.95
26.3	3,586	.89	20.9	9,848	.71	88	.93
26.0	3,899	.88	20.6	10,242	.70	100	.91
25.7	4,215	.87	20.3	10,642	.69	114	.89
25.4	4,535	.86	20.0	11,047	.68	128	.87

Any true refraction either in zenith or polar distance=tabulated refraction × coefficient for barometric pressure × coefficient for temperature.

The differences between the true and the tabulated refractions are generally small and generally negligible excepting for the combined effect of low apparent altitude of observation with high elevation above sea level or extremes of temperature.

See Smithsonian Meteorological Tables for revised data.

TABLE 22.—COEFFICIENTS FOR COMPUTING ERRORS IN AZIMUTH DUE TO SMALL ERRORS IN DECLINATION OR LATITUDE, TABULATED FOR 1′ ERRORS.

Lat.		Hours from noon.				
		2	3	4	5	6
°						
25	Decl.	2.21	1.56	1.27	1.14	1.10
	Lat.	1.91	1.10	0.64	0.30	0.00
30	Decl.	2.31	1.63	1.33	1.20	1.15
	Lat.	2.00	1.15	0.67	0.31	0.00
35	Decl.	2.44	1.73	1.41	1.26	1.22
	Lat.	2.11	1.22	0.70	0.33	0.00
40	Decl.	2.61	1.85	1.51	1.35	1.31
	Lat.	2.26	1.31	0.75	0.35	0.00
45	Decl.	2.83	2.00	1.63	1.46	1.41
	Lat.	2.45	1.41	0.82	0.38	0.00
50	Decl.	3.11	2.20	1.80	1.61	1.56
	Lat.	2.69	1.56	0.90	0.42	0.00
55	Decl.	3.49	2.47	2.01	1.80	1.74
	Lat.	3.02	1.74	1.01	0.47	0.00
60	Decl.	4.00	2.83	2.31	2.07	2.00
	Lat.	3.46	2.00	1.15	0.54	0.00
65	Decl.	4.73	3.35	2.73	2.45	2.37
	Lat.	4.10	2.37	1.37	0.63	0.00
70	Decl.	5.85	4.13	3.38	3.03	2.92
	Lat.	5.06	2.92	1.69	0.78	0.00

The coefficients for noon become infinitely large.

Direction of errors in azimuth from true south:

To the east in the a. m., to the west in the p. m.—

Latitude set or assumed to the N. of the true latitude, noon to six hours.

Latitude set or assumed to the S. of the true latitude, beyond six hours.

Declination set or assumed to the S. of the true declination, all hours.

To the west in the a. m., to the east in the p. m.—

Latitude set or assumed to the S. of the true latitude, noon to six hours.

Latitude set or assumed to the N. of the true latitude, beyond six hours.

Declination set or assumed to the N. of the true declination, all hours.

The error is considered as the erroneous fixation of the south point.

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins. Temp.=50° F.

Hours from noon.	Latitude.											
	25° 0′	27° 30′	30° 0′	25° 0′	27° 30′	30° 0′	25° 0′	27° 30′	30° 0′
	Decl.=23° 27′ N.			Decl.=22° 30′ N.			Decl.=20° 0′ N.		
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
0	0 2	0 4	0 7	0 3	0 5	0 8	0 5	0 8	0 10
2	0 5	0 7	0 10	0 6	0 8	0 11	0 9	0 11	0 14
3	0 8	0 12	0 16	0 10	0 13	0 17	0 14	0 17	0 20
4	0 20	0 23	0 27	0 22	0 25	0 29	0 25	0 28	0 32
5	0 44	0 49	0 53	0 46	0 51	0 55	0 50	0 55	1 0
6	2 7	2 9	2 10	2 12	2 14	2 16	2 29	2 31	2 33
	Decl.=17° 30′ N.			Decl.=15° 0′ N.			Decl.=12° 30′ N.		
0	0 8	0 10	0 13	0 10	0 13	0 16	0 13	0 16	0 18
2	0 11	0 13	0 16	0 14	0 16	0 19	0 16	0 19	0 22
3	0 16	0 19	0 23	0 19	0 22	0 26	0 22	0 25	0 29
4	0 28	0 31	0 35	0 31	0 35	0 39	0 34	0 38	0 43
5	0 54	1 0	1 5	0 59	1 5	1 10	1 4	1 11	1 17
6	2 49	2 52	2 55	3 15	3 19	3 22	3 49	3 53	3 57
	Decl.=10° 0′ N.			Decl.=7° 30′ N.			Decl.=5° 0′ N.		
0	0 16	0 18	0 21	0 18	0 21	0 24	0 21	0 24	0 27
2	0 19	0 22	0 25	0 22	0 25	0 28	0 25	0 28	0 31
3	0 25	0 28	0 32	0 28	0 31	0 35	0 31	0 34	0 38
4	0 37	0 42	0 47	0 41	0 46	0 51	0 46	0 51	0 56
5	1 10	1 17	1 24	1 17	1 25	1 33	1 25	1 33	1 42
	Decl.=2° 30′ N.			Decl.=0° 0′.			Decl.=2° 30′ S.		
0	0 24	0 27	0 30	0 27	0 30	0 33	0 30	0 33	0 37
2	0 28	0 31	0 34	0 31	0 34	0 38	0 34	0 38	0 42
3	0 34	0 38	0 42	0 38	0 42	0 47	0 41	0 46	0 51
4	0 50	0 55	1 1	0 55	1 0	1 6	0 59	1 5	1 12
5	1 33	1 43	1 53	1 42	1 53	2 5	1 52	2 5	2 20
	Decl.=5° 0′ S.			Decl.=7° 30′ S.			Decl.=10° 0′ S.		
0	0 33	0 37	0 40	0 37	0 40	0 44	0 40	0 44	0 48
2	0 38	0 42	0 47	0 42	0 46	0 51	0 46	0 50	0 55
3	0 45	0 50	0 56	0 49	0 55	1 1	0 53	1 0	1 7
4	1 4	1 11	1 19	1 10	1 18	1 27	1 17	1 26	1 36
5	2 5	2 23	2 41	2 20	2 43	3 6	2 39	3 5	3 36
	Decl.=12° 30′ S.			Decl.=15° 0′ S.			Decl.=17° 30′ S.		
0	0 44	0 48	0 53	0 48	0 53	0 58	0 53	0 58	1 3
2	0 50	0 55	1 0	0 54	1 0	1 6	0 59	1 5	1 12
3	0 58	1 5	1 13	1 4	1 12	1 20	1 11	1 19	1 28
4	1 24	1 34	1 46	1 31	1 43	1 57	1 40	1 54	2 11
4½	1 51	2 9	2 28	2 2	2 23	2 47	2 14	2 40	3 13
	Decl.=20° 0′ S.			Decl.=22° 30′ S.			Decl.=23° 27′ S.		
0	0 58	1 3	1 9	1 3	1 9	1 15	1 5	1 12	1 18
2	1 5	1 11	1 18	1 11	1 18	1 26	1 13	1 20	1 29
3	1 18	1 27	1 37	1 25	1 35	1 46	1 28	1 38	1 50
4	1 52	2 8	2 28	2 4	2 23	2 48	2 10	2 32	2 58
4½	2 30	3 3	3 47	2 53	3 34	4 31	3 11	3 57	5 0

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins. Temp.=50° F.

Hours from noon.	Latitude. 30° 0′	32° 30′	35° 0′	37° 30′	40° 0′	42° 30′	45° 0′	47° 30′	50° 0′
	Declination of the sun, 23° 27′ N.								
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
0	0 7	0 9	0 12	0 15	0 18	0 20	0 23	0 26	0 29
2	0 10	0 13	0 16	0 19	0 22	0 24	0 27	0 30	0 34
3	0 16	0 19	0 22	0 25	0 28	0 31	0 35	0 38	0 41
4	0 27	0 30	0 34	0 37	0 41	0 45	0 49	0 53	0 56
5	0 53	0 57	1 0	1 4	1 7	1 11	1 14	1 17	1 20
6	2 10	2 11	2 11	2 11	2 11	2 11	2 11	2 11	2 12
6½	4 35	4 14	3 57	3 44	3 33	3 23	3 15	3 7	3 0
	Declination of the sun, 22° 30′ N.								
0	0 8	0 10	0 13	0 16	0 18	0 21	0 24	0 27	0 30
2	0 11	0 14	0 17	0 20	0 23	0 26	0 29	0 32	0 35
3	0 17	0 20	0 23	0 26	0 29	0 32	0 36	0 40	0 43
4	0 29	0 32	0 35	0 39	0 43	0 47	0 51	0 55	0 58
5	0 55	0 59	1 2	1 6	1 10	1 13	1 16	1 20	1 23
6	2 16	2 17	2 17	2 17	2 17	2 17	2 17	2 17	2 18
6½	5 3	4 38	4 17	4 1	3 47	3 34	3 23	3 14	3 7
	Declination of the sun, 20° 0′ N.								
0	0 10	0 13	0 16	0 18	0 21	0 24	0 27	0 30	0 33
2	0 14	0 16	0 19	0 22	0 25	0 28	0 32	0 35	0 38
3	0 20	0 23	0 26	0 29	0 32	0 35	0 39	0 43	0 48
4	0 32	0 35	0 39	0 43	0 47	0 51	0 55	0 59	1 2
5	1 0	1 4	1 8	1 12	1 16	1 20	1 24	1 28	1 31
5½	1 27	1 32	1 37	1 41	1 45	1 49	1 53	1 56	1 58
6	2 33	2 34	2 34	2 35	2 35	2 36	2 36	2 36	2 36
6½	6 12	5 40	5 14	4 52	4 34	4 19	4 7	3 57	3 49
	Declination of the sun, 17° 30′ N.								
0	0 13	0 16	0 18	0 21	0 24	0 27	0 30	0 33	0 37
2	0 16	0 19	0 22	0 25	0 28	0 31	0 35	0 38	0 42
3	0 23	0 26	0 29	0 32	0 36	0 39	0 43	0 47	0 52
4	0 35	0 39	0 43	0 47	0 51	0 55	1 0	1 4	1 7
5	1 5	1 10	1 14	1 19	1 23	1 27	1 32	1 37	1 40
5½	1 37	1 42	1 46	1 51	1 55	2 0	2 4	2 7	2 10
6	2 55	2 56	2 56	2 57	2 58	2 59	2 59	2 59	2 59
	Declination of the sun, 15° 0′ N.								
0	0 16	0 18	0 21	0 24	0 27	0 30	0 33	0 37	0 40
2	0 19	0 22	0 25	0 28	0 31	0 34	0 38	0 42	0 47
3	0 26	0 29	0 33	0 36	0 40	0 44	0 48	0 52	0 57
4	0 39	0 44	0 48	0 52	0 56	1 0	1 5	1 9	1 14
5	1 10	1 16	1 21	1 26	1 31	1 36	1 41	1 46	1 51
5½	1 48	1 53	1 58	2 3	2 8	2 13	2 18	2 22	2 26
6	3 22	3 24	3 25	3 26	3 27	3 28	3 28	3 29	3 30

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins Temp.=50° F.

Hours from noon.	Latitude. 30° 0′		32° 30′		35° 0′		37° 30′		40° 0′		42° 30′		45° 0′		47° 30′		50° 0′	
	Declination of the sun, 12° 30′ N.																	
	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″
0	0	18	0	21	0	24	0	27	0	30	0	33	0	37	0	40	0	44
2	0	22	0	25	0	28	0	31	0	34	0	38	0	42	0	46	0	51
3	0	29	0	32	0	36	0	40	0	44	0	48	0	52	0	57	1	2
4	0	43	0	47	0	52	0	56	1	1	1	6	1	11	1	16	1	21
5	1	17	1	23	1	29	1	35	1	40	1	46	1	51	1	57	2	4
5½	2	0	2	6	2	12	2	18	2	24	2	30	2	36	2	41	2	46
6	3	57	4	0	4	4	4	6	4	7	4	8	4	8	4	10	4	11
	Declination of the sun, 10° 0′ N.																	
0	0	21	0	24	0	27	0	30	0	33	0	37	0	40	0	44	0	48
2	0	25	0	28	0	32	0	35	0	38	0	42	0	47	0	51	0	56
3	0	32	0	35	0	39	0	44	0	49	0	53	0	57	1	2	1	7
4	0	47	0	51	0	56	1	1	1	7	1	12	1	18	1	23	1	29
5	1	24	1	31	1	38	1	45	1	51	1	57	2	4	2	11	2	19
5½	2	14	2	22	2	30	2	38	2	45	2	52	2	59	3	6	3	13
6	4	50	4	54	4	58	5	1	5	3	5	5	5	6	5	8	5	9
	Declination of the sun, 7° 30′ N.																	
0	0	24	0	27	0	30	0	33	0	37	0	40	0	44	0	48	0	53
2	0	28	0	31	0	35	0	38	0	42	0	46	0	51	0	56	1	1
3	0	35	0	39	0	43	0	48	0	53	0	58	1	2	1	8	1	13
4	0	51	0	56	1	1	1	7	1	13	1	19	1	25	1	32	1	38
5	1	33	1	40	1	48	1	56	2	4	2	12	2	20	2	29	2	38
5½	2	31	2	41	2	52	3	2	3	11	3	20	3	29	3	39	3	48
	Declination of the sun, 5° 0′ N.																	
0	0	27	0	30	0	33	0	37	0	40	0	44	0	48	0	53	0	58
2	0	31	0	34	0	38	0	42	0	47	0	51	0	56	1	1	1	6
3	0	38	0	43	0	48	0	53	0	58	1	3	1	8	1	14	1	20
4	0	56	1	1	1	7	1	13	1	19	1	26	1	33	1	41	1	49
5	1	42	1	51	2	0	2	10	2	20	2	30	2	40	2	51	3	2
5½	2	53	3	5	3	18	3	31	3	44	3	57	4	10	4	23	4	35
	Declination of the sun, 2° 30′ N.																	
0	0	30	0	33	0	37	0	40	0	44	0	48	0	53	0	58	1	3
2	0	34	0	38	0	42	0	46	0	51	0	56	1	1	1	6	1	12
3	0	42	0	47	0	52	0	58	1	3	1	9	1	14	1	21	1	28
4	1	1	1	7	1	14	1	20	1	27	1	35	1	43	1	52	2	1
5	1	53	2	3	2	14	2	27	2	39	2	52	3	5	3	19	3	33
5½	3	21	3	37	3	53	4	11	4	29	4	49	5	9	5	28	5	47

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins. Temp.=50° F.

Hours from noon.	Latitude. 30° 0′		32° 30′		35° 0′		37° 30′		40° 0′		42° 30′		45° 0′		47° 30′		50° 0′	
	Declination of the sun, 0° 0′.																	
	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″
0	0	33	0	37	0	40	0	44	0	48	0	53	0	58	1	3	1	9
2	0	38	0	42	0	47	0	51	0	56	1	1	1	7	1	12	1	18
3	0	47	0	52	0	57	1	3	1	9	1	15	1	21	1	28	1	36
4	1	6	1	13	1	21	1	28	1	36	1	45	1	54	2	4	2	16
4½	1	26	1	35	1	44	1	54	2	4	2	16	2	29	2	42	2	55
5	2	5	2	18	2	32	2	47	3	2	3	19	3	37	3	56	4	15
	Declination of the sun, 2° 30′ S.																	
0	0	37	0	40	0	44	0	48	0	53	0	58	1	3	1	9	1	15
2	0	42	0	46	0	51	0	56	1	1	1	7	1	13	1	20	1	27
3	0	51	0	57	1	2	1	8	1	15	1	22	1	29	1	37	1	46
4	1	12	1	20	1	28	1	37	1	46	1	57	2	8	2	20	2	34
4½	1	34	1	45	1	56	2	8	2	21	2	34	2	50	3	7	3	25
5	2	20	2	36	2	54	3	13	3	32	3	55	4	20	4	47	5	16
	Declination of the sun, 5° 0′ S.																	
0	0	40	0	44	0	48	0	53	0	58	1	3	1	9	1	15	1	22
2	0	47	0	51	0	56	1	1	1	7	1	13	1	20	1	28	1	36
3	0	56	1	2	1	8	1	14	1	21	1	29	1	38	1	48	1	59
4	1	19	1	28	1	37	1	47	1	58	2	11	2	25	2	40	2	57
4½	1	44	1	57	2	10	2	24	2	40	2	57	3	17	3	40	4	6
5	2	41	2	59	3	22	3	47	4	15	4	46	5	21	6	2	6	52
	Declination of the sun, 7° 30′ S.																	
0	0	44	0	48	0	53	0	58	1	3	1	9	1	15	1	22	1	30
2	0	51	0	55	1	1	1	6	1	13	1	20	1	28	1	37	1	46
3	1	1	1	8	1	15	1	22	1	30	1	38	1	48	2	0	2	14
4	1	27	1	37	1	47	1	59	2	12	2	28	2	45	3	4	3	27
4½	1	56	2	11	2	27	2	44	3	4	3	27	3	53	4	26	5	4
5	3	6	3	30	3	59	4	34	5	13	5	57	6	45				
	Declination of the sun, 10° 0′ S.																	
0	0	48	0	53	0	58	1	3	1	9	1	15	1	22	1	30	1	40
2	0	55	1	0	1	6	1	12	1	19	1	27	1	36	1	46	1	58
3	1	7	1	14	1	22	1	30	1	39	1	49	2	1	2	15	2	31
4	1	36	1	47	1	59	2	13	2	30	2	49	3	10	3	36	4	7
4½	2	11	2	28	2	47	3	10	3	36	4	8	4	44	5	30	6	28

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins. Temp.=50° F.

Hours from noon.	Latitude. 30°0′		32°30′		35°0′		37°30′		40°0′		42°30′		45°0′		47°30′		50°0′	
	Declination of the sun, 12° 30′S.																	
	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″
0	0	53	0	58	1	3	1	9	1	15	1	22	1	30	1	40	1	50
2	1	0	1	6	1	13	1	20	1	27	1	36	1	46	1	57	2	11
3	1	13	1	21	1	30	1	39	1	50	2	1	2	16	2	33	2	52
4	1	46	1	59	2	14	2	31	2	52	3	16	3	43	4	19	5	4
4½	2	28	2	49	3	13	3	44	4	20	5	5	6	0				
	Declination of the sun, 15° 0′ S.																	
0	0	58	1	3	1	9	1	15	1	22	1	30	1	40	1	50	2	3
2	1	6	1	12	1	20	1	28	1	36	1	46	1	58	2	10	2	26
3	1	20	1	28	1	38	1	49	2	2	2	16	2	34	2	54	3	20
3½	1	34	1	45	1	57	2	12	2	29	2	48	3	12	3	42	4	21
4	1	57	2	14	2	33	2	55	3	20	3	52	4	30	5	18	6	32
4½	2	47	3	15	3	47	4	29	5	20	6	28						
	Declination of the sun, 17° 30′ S.																	
0	1	3	1	9	1	15	1	22	1	30	1	40	1	50	2	3	2	18
2	1	12	1	19	1	28	1	37	1	46	1	58	2	12	2	26	2	48
3	1	28	1	37	1	48	2	1	2	17	2	35	2	57	3	22	4	0
3½	1	43	1	57	2	12	2	29	2	50	3	15	3	47	4	28	5	24
4	2	11	2	31	2	55	3	23	3	57	4	42	5	40	6	56		
	Declination of the sun, 20° 0′ S.																	
0	1	9	1	15	1	22	1	30	1	40	1	50	2	3	2	18	2	37
2	1	18	1	27	1	36	1	46	1	58	2	12	2	29	2	47	3	17
3	1	37	1	47	2	0	2	16	2	35	2	58	3	26	4	0	4	54
3½	1	54	2	10	2	29	2	50	3	17	3	51	4	36	5	30	7	7
4	2	28	2	52	3	21	3	56	4	47	5	58						
	Declination of the sun, 22° 30′ S.																	
0	1	15	1	22	1	30	1	40	1	50	2	3	2	18	2	37	3	1
2	1	26	1	35	1	45	1	57	2	12	2	29	2	49	3	13	3	53
2½	1	34	1	45	1	57	2	11	2	28	2	49	3	16	3	50	4	32
3	1	46	1	59	2	15	2	34	2	57	3	26	4	4	4	56	6	10
3½	2	7	2	25	2	48	3	18	3	51	4	38	5	43				
4	2	48	3	19	3	57	4	46	5	56								
	Declination of the sun, 23° 27′ S.																	
0	1	18	1	25	1	34	1	44	1	55	2	9	2	25	2	46	3	12
2	1	29	1	39	1	50	2	3	2	18	2	37	3	0	3	28	4	10
2½	1	36	1	49	2	3	2	18	2	37	3	1	3	31	4	11	5	9
3	1	50	2	6	2	23	2	44	3	9	3	43	4	27	5	25	7	1
3½	2	15	2	33	2	58	3	32	4	12	5	4	6	25				
4	2	58	3	32	4	17	5	14	6	45								

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins. Temp.=50° F.

Hours from noon.	Latitude.															
	50° 0′		52° 30′		55° 0′		57° 30′		60° 0′		62° 30′		65° 0′		67° 30′		70° 0′	
	Declination of the sun, 23° 27′ N.															
	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″
0	0	29	0	32	0	35	0	39	0	42	0	46	0	51	0	56	1	1
2	0	34	0	37	0	41	0	44	0	48	0	52	0	57	1	1	1	6
3	0	41	0	44	0	48	0	52	0	56	1	0	1	5	1	9	1	14
4	0	56	0	59	1	2	1	5	1	9	1	13	1	18	1	22	1	26
5	1	20	1	23	1	26	1	29	1	32	1	35	1	38	1	41	1	44
6	2	12	2	12	2	12	2	12	2	12	2	12	2	12	2	12	2	12
	Declination of the sun, 22° 30′ N.															
0	0	30	0	33	0	37	0	40	0	44	0	48	0	53	0	58	1	3
2	0	35	0	38	0	42	0	45	0	49	0	53	0	58	1	3	1	8
3	0	43	0	46	0	50	0	54	0	58	1	2	1	7	1	11	1	16
4	0	58	1	1	1	4	1	7	1	11	1	15	1	20	1	24	1	29
5	1	23	1	26	1	29	1	32	1	35	1	38	1	42	1	45	1	48
6	2	18	2	18	2	18	2	18	2	18	2	18	2	18	2	18	2	18
	Declination of the sun, 20° 0′ N.															
0	0	33	0	37	0	40	0	44	0	48	0	53	0	58	1	3	1	9
2	0	38	0	42	0	46	0	50	0	54	0	58	1	3	1	9	1	15
3	0	48	0	51	0	55	0	59	1	3	1	8	1	13	1	18	1	24
4	1	2	1	6	1	10	1	14	1	18	1	22	1	27	1	32	1	38
5	1	31	1	34	1	38	1	41	1	45	1	49	1	53	1	57	2	1
6	2	36	2	36	2	36	2	36	2	36	2	36	2	36	2	37	2	37
	Declination of the sun, 17° 30′ N.															
0	0	37	0	40	0	44	0	48	0	53	0	58	1	3	1	9	1	15
2	0	42	0	46	0	50	0	54	0	59	1	4	1	9	1	15	1	22
3	0	52	0	56	1	0	1	4	1	9	1	14	1	20	1	26	1	33
4	1	7	1	12	1	17	1	21	1	26	1	31	1	36	1	42	1	49
5	1	40	1	44	1	48	1	52	1	57	2	2	2	7	2	11	2	15
6	2	59	2	59	2	59	2	59	2	59	2	59	2	59	3	0	3	0
	Declination of the sun, 15° 0′ N.															
0	0	40	0	44	0	48	0	53	0	58	1	3	1	9	1	15	1	22
2	0	47	0	51	0	55	1	0	1	5	1	10	1	16	1	23	1	30
3	0	57	1	1	1	6	1	10	1	15	1	21	1	28	1	35	1	43
4	1	14	1	19	1	24	1	29	1	35	1	41	1	47	1	54	2	1
5	1	51	1	56	2	1	2	6	2	12	2	17	2	23	2	28	2	34
6	3	30	3	30	3	30	3	30	3	30	3	30	3	30	3	31	3	31

TABLE 23.—MEAN REFRACTIONS IN POLAR DISTANCE.

Bar.=29.6 ins. Temp.=50° F.

Hours from noon.	Latitude.															
	50° 0′		52° 30′		55° 0′		57° 30′		60° 0′		62° 30′		65° 0′		67° 30′		70° 0′	
	Declination of the sun, 12° 30′ N.															
	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″
0	0	44	0	48	0	53	0	58	1	3	1	9	1	15	1	22	1	30
2	0	51	0	56	1	1	1	6	1	11	1	17	1	23	1	30	1	39
3	1	2	1	7	1	12	1	17	1	22	1	29	1	37	1	45	1	54
4	1	21	1	27	1	32	1	38	1	45	1	52	1	59	2	7	2	16
5	2	4	2	10	2	16	2	22	2	29	2	35	2	42	2	49	2	57
6	4	11	4	12	4	12	4	12	4	12	4	12	4	13	4	13	4	13
	Declination of the sun, 10° 0′ N.															
0	0	48	0	53	0	58	1	3	1	9	1	15	1	22	1	30	1	40
2	0	56	1	1	1	7	1	12	1	18	1	25	1	32	1	41	1	50
3	1	7	1	12	1	18	1	24	1	31	1	39	1	47	1	56	2	6
4	1	29	1	35	1	42	1	49	1	57	2	5	2	14	2	24	2	34
5	2	19	2	26	2	34	2	42	2	50	2	58	3	7	3	16	3	26
6	5	9	5	9	5	10	5	10	5	10	5	11	5	11	5	12	5	12
	Declination of the sun, 7° 30′ N.															
0	0	53	0	58	1	3	1	9	1	15	1	22	1	30	1	40	1	50
2	1	1	1	7	1	12	1	19	1	26	1	34	1	42	1	52	2	3
3	1	13	1	19	1	25	1	33	1	41	1	50	1	59	2	9	2	21
4	1	38	1	45	1	53	2	2	2	11	2	21	2	32	2	44	2	57
5	2	38	2	47	2	57	3	7	3	17	3	28	3	40	3	53	4	6
	Declination of the sun, 5° 0′ N.															
0	0	58	1	3	1	9	1	15	1	22	1	30	1	40	1	50	2	3
2	1	6	1	12	1	18	1	26	1	35	1	44	1	53	2	4	2	18
3	1	20	1	27	1	34	1	43	1	52	2	2	2	14	2	27	2	40
4	1	49	1	57	2	5	2	16	2	28	2	41	2	55	3	10	3	27
5	3	2	3	14	3	26	3	39	3	53	4	8	4	24	4	42	5	1
	Declination of the sun, 2° 30′ N.															
0	1	3	1	9	1	15	1	22	1	30	1	40	1	50	2	3	2	18
2	1	12	1	19	1	25	1	34	1	44	1	55	2	6	2	20	2	37
3	1	28	1	35	1	44	1	54	2	5	2	18	2	32	2	48	3	5
4	2	1	2	12	2	21	2	34	2	49	3	6	3	24	3	44	4	8
5	3	33	3	50	4	6	4	25	4	45	5	7	5	32	6	0	6	31
	Declination of the sun, 0° 0′.															
0	1	9	1	15	1	22	1	30	1	40	1	50	2	3	2	18	2	37
2	1	18	1	26	1	34	1	43	1	54	2	6	2	20	2	38	3	1
3	1	36	1	45	1	55	2	7	2	20	2	35	2	53	3	14	3	39
4	2	16	2	29	2	43	2	58	3	16	3	36	4	0	4	28	5	3
5	4	15	4	38	5	2	5	29	5	59	6	33	7	13	7	59	8	53

TABLE 24.—TRIGONOMETRIC FORMULAS FOR THE SOLUTION OF PLANE TRIANGLES.

Let A = angle BAC = arc BF, and let the radius $AF = AB = AH = 1$.
We then have

sin A	$= BC$
cos A	$= AC$
tan A	$= DF$
cot A	$= HG$
sec A	$= AD$
cosec A	$= AG$
versin A	$= CF = BE$
covers A	$= BK = HL$
exsec A	$= BD$
coexsec A	$= PG$
chord A	$= BF$
chord $2A$	$= BI = 2BC$

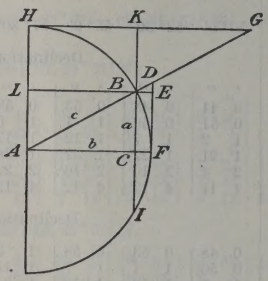

FIG 1.

In the right-angled triangle ABC
Let $AB = c$, $AC = b$, and $BC = a$.
We then have:

1. $\sin A = \frac{a}{c} = \cos B$
2. $\cos A = \frac{b}{c} = \sin B$
3. $\tan A = \frac{a}{b} = \cot B$
4. $\cot A = \frac{b}{a} = \tan B$
5. $\sec A = \frac{c}{b} = \operatorname{cosec} B$
6. $\operatorname{cosec} A = \frac{c}{a} = \sec B$
7. $\operatorname{vers} A = \frac{c-b}{c} = \operatorname{covers} B$
8. $\operatorname{exsec} A = \frac{c-b}{b} = \operatorname{coexsec} B$
9. $\operatorname{covers} A = \frac{c-a}{c} = \operatorname{versin} B$
10. $\operatorname{coexsec} A = \frac{c-a}{a} = \operatorname{exsec} B$
11. $a = c \sin A = b \tan A$
12. $b = c \cos A = a \cot A$
13. $c = \frac{a}{\sin A} = \frac{b}{\cos A}$
14. $a = c \cos B = b \cot B$
15. $b = c \sin B = a \tan B$
16. $c = \frac{a}{\cos B} = \frac{b}{\sin B}$
17. $a = \sqrt{(c+b)(c-b)}$
18. $b = \sqrt{(c+a)(c-a)}$
19. $c = \sqrt{a^2+b^2}$
20. $C = 90° = A+B$

21. $\text{area} = \frac{ab}{2}$

TABLE 24.—TRIGONOMETRIC FORMULAS FOR THE SOLUTION OF PLANE TRIANGLES.

Solution of Oblique Triangles.

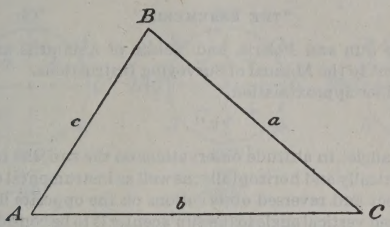

Fig. 2.

	GIVEN.	SOUGHT.	FORMULA.
22	A, B, a	C, b, c	$C=180°-(A+B)$, $b=\frac{a}{\sin A}\cdot \sin B$, $c=\frac{a}{\sin A}\sin(A+B)$
23	A, a, b	B, C, c	$\sin B=\frac{\sin A}{a}\cdot b$, $C=180°-(A+B)$, $c=\frac{a}{\sin A}\cdot \sin C$.
24	C, a, b	$\frac{1}{2}(A+B)$	$\frac{1}{2}(A+B)=90°-\frac{1}{2}C$
25		$\frac{1}{2}(A-B)$	$\tan\frac{1}{2}(A-B)=\frac{a-b}{a+b}\tan\frac{1}{2}(A+B)$
26		A, B	$A=\frac{1}{2}(A+B)+\frac{1}{2}(A-B)$, $B=\frac{1}{2}(A+B)-\frac{1}{2}(A-B)$
27		c	$c=(a+b)\frac{\cos\frac{1}{2}(A+B)}{\cos\frac{1}{2}(A-B)}=\sqrt{a^2+b^2-2ab\cos C}$
28		area	area$=\frac{1}{2}ab\sin C$.
29	a, b, c	A	Let $s=\frac{1}{2}(a+b+c)$; $\sin\frac{1}{2}A=\sqrt{\frac{(s-b)(s-c)}{bc}}$
30			$\cos\frac{1}{2}A=\sqrt{\frac{s(s-a)}{bc}}$; $\tan\frac{1}{2}A=\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$
31			$\sin A=\frac{2\sqrt{s(s-a)(s-b)(s-c)}}{bc}$; $\cos A=\frac{b^2+c^2-a^2}{2bc}$
32		area	area$=\sqrt{s(s-a)(s-b)(s-c)}$
33	A, B, C, a	area	area$=\frac{a^2\sin B\cdot\sin C}{2\sin A}$

TABLE 25.—TRIGONOMETRIC FORMULAS FOR THE SOLUTION OF STADIA MEASUREMENTS, OBSERVATIONS FOR TIME, LATITUDE AND AZIMUTH, AND PROBLEMS IN CONVERGENCY.

NOTATION.

"THE EPHEMERIS."

"Ephemeris of the Sun and Polaris, and Tables of Azimuths and Altitudes of Polaris," a supplement to the Manual of Surveying Instructions.

"$\neq$": The symbol for approximation.

"v."

Observed vertical angle; in altitude observations on the sun, the reductions to the sun's center both vertically and horizontally, as well as instrumental errors, are eliminated by taking direct and reversed observations on the opposite limbs of the sun, and the mean observed vertical angle to the sun's center is to be considered "v" in the notation. In single observations the vertical reduction to the sun's center $= 16'$; a refinement is had by referring to the Ephemeris for the value of the sun's semidiameter for the date of observation.

"h."

True vertical angle to the sun's center, or to Polaris, in altitude observations, after correction for refraction: $h = v -$ refraction in zenith distance; a refinement is had in altitude observations on the sun by adding the value of the sun's parallax $= 8''.9 \cos v$, opposite in effect to refraction.

"ζ."

Zeta: True zenith distance of the sun's center.

$$\zeta = 90° - h.$$

"ϕ."

Phi: Latitude of the station of observation.

"λ."

Lambda: Longitude of the station of observation.

"δ."

Delta: Declination of the sun or Polaris; to be taken from the Ephemeris for the date of observation; the declination of the sun is to be corrected in hourly difference to the longitude of the station and to the time of observation: north declinations are treated as positive and south declinations as negative; a northerly hourly motion is treated as positive and a southerly hourly motion is treated as negative; in the use of the solar attachment the declination of the sun is to be corrected for refraction in polar distance, always north.

"A."

Azimuth angle from the true meridian to Polaris, or to the sun's center; in the following analytical solutions "A" is referred to the north point unless otherwise modified, and the reductions are symmetrical either east or west of the meridian; all determinations for azimuth imply the recording of horizontal angles from a fixed reference point to Polaris or to the sun, or a point marked on the ground to define the direction of observation, the mean horizontal angle, or the mean point in direction, being used in the determination; in single observations on the sun, the reduction to the sun's center in azimuth $= \frac{16'}{\cos v}$; a refinement in the value of the sun's semidiameter is had by referring to the Ephemeris for the date of observation.

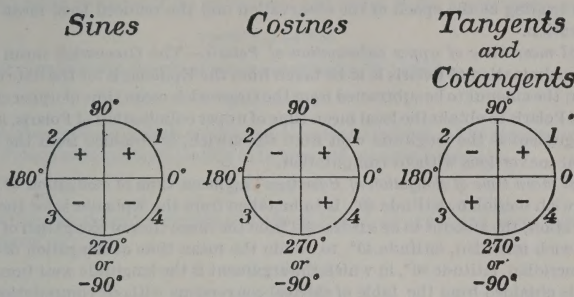

FIG. 3.

STADIA MEASUREMENTS.

Hor. dis.: The true horizontal distance from the center of the instrument to the rod.

Diff. elev.: The true vertical distance from the height of the instrument to the center point between the two targets of the rod.

"r": Vertical rod reading.

"K": The wire interval or ratio, to be determined in the field by frequent tests under working conditions in comparison with steel tape measurement, solving the formula given below for "K," hor. dis. known.

"c": Distance from the center of the instrument to the object glass.

"f": Distance from the plane of the cross-wires to the object glass.

$$\text{Hor. dis.} = K\,r\cos^2 v + (c+f)\cos v.$$
$$\text{Diff. elev.} = K\,r\,\tfrac{1}{2}\sin 2v + (c+f)\sin v.$$

In public land surveying it is convenient to have fixed stadia wires with a ratio of 1:132 so that the sum of two rod readings in feet will be equivalent to a ratio of 1:66, or a reduced distance in chains; it is also convenient to reduce the error in the wire interval to the error in 10 chs., and to eliminate the error by applying to the reduced distance the proper amount taken from the table of proportional parts. With a ratio of 1:100, using a rod graduated to links, the elimination of the error in the wire interval is conveniently made in the same manner. With a ratio of 1:100, using a rod graduated to feet, the reduction is simplified by determining the logarithm of the true "K," rod in feet and horizontal distance in chains units, accomplishing the reduction of $K\,r\cos^2 v$ by logarithmic functions.

TIME.

Conversion of standard time into local mean time.—Watch reading ± watch error in standard time by comparison ± correction for longitude; the correction for longitude is additive east and subtractive west of the standard meridian of the time belt; the conversion table "degrees to time" is convenient in this reduction.

Conversion of apparent time into local mean time.—Apparent time of observation ± the equation of time; the equation of time is to be taken from the Ephemeris for the date of observation and corrected for the longitude and time of observation, conveniently interpolated as the interval from Greenwich noon to the time of observation;

the watch error in local mean time is then found by taking the difference between the watch reading at the epoch of the observation and the reduced local mean time of observation.

Local mean time of upper culmination of Polaris.—The Greenwich mean time of upper culmination of Polaris is to be taken from the Ephemeris for the date of observation; the amount to be subtracted from the Greenwich mean time of upper culmination of Polaris to obtain the local mean time of upper culmination of Polaris, in which the argument is the longitude west from Greenwich, is obtained from the table of sidereal conversions without computation.

Local mean time of elongation of Polaris.—The mean time of elongation of Polaris, Greenwich meridian, latitude 40°, is to be taken from the Ephemeris for the date of observation; the amount to be subtracted from the mean time of elongation of Polaris, Greenwich meridian, latitude 40°, to obtain the mean time of elongation of Polaris, local meridian, latitude 40°, in which the argument is the longitude west from Greenwich, is obtained from the table of sidereal conversions without computation. The amount to apply to the local mean time of elongation of Polaris latitude 40° to obtain the local mean time of elongation of Polaris latitude of observation is tabulated in the Ephemeris in connection with the table of azimuths of Polaris at elongation.

Conversion of a mean time interval into a sidereal time interval, or vice versa.—The amount to apply to one time interval to obtain the other time interval is obtained from the table of sidereal conversions without computation.

Hour angles of Polaris.—A mean time hour angle of Polaris west of the meridian is the mean time interval from the local mean time of upper culmination of Polaris to the local mean time of observation of Polaris; a mean time hour angle of Polaris east of the meridian is the mean time interval from the local mean time of observation of Polaris to the local mean time of upper culmination of Polaris.

Mean time hour angle of Polaris at elongation.—"t"=the sidereal hour angle in angular measure, this converted into time measure, and this in turn converted from a sidereal time interval into a mean time interval gives the mean time hour angle of Polaris at elongation:

$$\text{Cos } t = \text{cotan } \delta \text{ tan } \phi$$

Altitude observation of the sun for apparent time.—"t"=hour angle from apparent noon in angular measure; reverse the signs of "δ" for south declinations:

$$\text{Tan } \tfrac{1}{2} t = \sqrt{\frac{\sin \frac{1}{2} (\zeta+\phi-\delta) \sin \frac{1}{2} (\zeta-\phi+\delta)}{\cos \frac{1}{2} (\zeta+\phi+\delta) \cos \frac{1}{2} (\zeta-\phi-\delta)}}$$

Meridian observation of the sun for apparent noon.—With the telescope in the meridian elevated to the sun's altitude, the watch times of transit of the sun's west and east limbs are noted, the mean of which is the watch time of apparent noon; if the observation fails for either limb the reduction to the sun's center is accomplished by adding or subtracting 68 seconds; a refinement in the amount of this time is had by referring to the Ephemeris for the time of the sun's semidiameter passing the meridian for the date of observation; the setting for the approximate altitude of the sun's center is:

$$V \neq 90° - \phi \pm \delta$$

LATITUDE.

Meridian altitude observation of the sun for latitude.—Reverse the sign of "δ" for south declinations:

$$\phi = 90 + \delta - h$$

This observation is conveniently combined with the meridian observation of the sun for time, observing simultaneously the sun's lower and west limbs, recording the watch time and the vertical angle and reversing in the interval of about 2½ min-

utes, and observing simultaneously the sun's upper and east limbs; the settings for the approximate altitudes of the sun's lower and upper limbs, respectively, are:

$$v \neq 90° - \phi \pm \delta \mp 16'$$

Altitude observation of Polaris at upper culmination for latitude.—

$$\phi = h + \delta - 90°$$

Altitude observation of Polaris at lower culmination for latitude.—The mean time hour angle of Polaris at lower culmination is 11 hours 58 minutes 2 seconds:

$$\phi = h + 90° - \delta$$

The settings for the approximate altitude of Polaris at upper and lower culminations, respectively, are:

$$v \neq \phi \pm (90° - \delta)$$

AZIMUTH.

Altitude observation of the sun for azimuth.—Reverse the signs of "δ" for south declinations:

$$\text{Tan } \tfrac{1}{2} \text{ A} = \sqrt{\frac{\cos \tfrac{1}{2} (\zeta + \phi + \delta) \sin \tfrac{1}{2} (\zeta + \phi - \delta)}{\cos \tfrac{1}{2} (\zeta - \phi - \delta) \sin \tfrac{1}{2} (\zeta - \phi + \delta)}}$$

The spherical angles "ζ," "ϕ," and "δ" appear in this equation combined as in the formula for the reduction of an altitude observation of the sun for apparent time, and when it is desired to reduce for both time and azimuth, the above equation for azimuth is to be preferred to any that follow.

Altitude observation of the sun for azimuth.—For south declinations the function "sin δ" becomes negative by virtue of the sine of a negative angle being treated as negative in analytical reductions: If the algebraic sign of the result is positive the azimuth "A" is referred to the north point, but if negative, the azimuth "A" is referred to the south point:

$$\text{Cos A} = \frac{\sin \delta}{\cos \phi \cos h} - \tan \phi \tan h$$

The above equation is very convenient in reducing for azimuth only.

Altitude observation of the sun for azimuth.—To many surveyors the following equation is familiarly expressed directly in terms of the spherical triangle "pole-zenith-sun"; reverse the sign of "δ" for south declinations:

Pole to zenith = 90° − ϕ = colat.;
Pole to sun = 90° − δ = codecl.;
Zenith to sun = 90° − h = coalt.;
S = ½ sum of the three sides:

$$\text{Cos } \tfrac{1}{2} \text{ A} = \sqrt{\frac{\sin \text{ S} \sin (\text{S} - \text{codecl.})}{\sin \text{ colat. } \sin \text{ coalt.}}}$$

Equal altitude observations of the sun for meridian.—The sun's center at equal altitudes occupies symmetrical positions in azimuth east and west of the meridian in the morning and in the afternoon except for the correction necessary to be applied due to the change in the sun's declination in the interval between the a. m. and p. m. observations:

"$d\,\text{A}_\delta$": Correction in azimuth in minutes of angular measure to be applied to the mean position in azimuth to obtain the true south point; the correction is to be applied to the east with a northerly hourly change in declination, or to the west with a southerly hourly change.

"$d\,\delta$": Change in declination of the sun from the a. m. to the p. m. observation, expressed in minutes of angular measure.

"(t_1+t_2)": The sum of the hour angles from apparent noon, or the total watch time from the a. m. to the p. m. observation, expressed in angular measure.

$$d\,A_\delta = \frac{\frac{1}{2}\,d\,\delta}{\cos\,\phi\,\sin\,\frac{1}{2}\,(t_1+t_2)}$$

The symmetry of the equal altitude observation is preserved by observing opposite limbs in azimuth in the a. m. and p. m. observations, in connection with the same limb in vertical angle in both observations.

With "$\frac{1}{2}\,d\,\delta$" and "$\frac{1}{2}\,(t_1+t_2)$" calculated, the computation can be concluded by applying to "$\frac{1}{2}\,d\,\delta$" the declination coefficient obtained by entering the table of coefficients for computing errors in azimuth due to small errors in declination, arguments: "ϕ" and "$\frac{1}{2}\,(t_1+t_2)$."

Azimuth of Polaris at elongation.—

$$\text{Sin A} = \frac{\cos\,\delta}{\cos\,\phi}$$

A table of azimuths of Polaris at elongation, for latitudes from 25° to 70° N., appears in the Ephemeris, arguments: "δ" and "ϕ."

Azimuth of Polaris at any hour angle.—"t" = sidereal hour angle in angular measure; in hour angles exceeding 90° the function "$-\sin\,\phi\,\cos\,t$" becomes positive by virtue of the cosine of an angle between 90° and 270° being treated as negative in analytical reductions:

$$\text{Tan A} = \frac{\sin\,t}{\cos\,\phi\,\tan\,\delta - \sin\,\phi\,\cos\,t}$$

A table of azimuths of Polaris at all hour angles, for latitudes from 30° to 50° N., appears in the Ephemeris, arguments: "δ," mean time hour angle, and "ϕ."

For other than the above latitudes the surveyor will be required to perform the above analytical solution, accomplished by the following process: convert the usual mean time hour angle into sidereal hour angle, and convert the sidereal hour angle into angular measure to obtain "t" for the above equation.

Polaris at sunset or sunrise.—Polaris is conveniently observed for azimuth by the hour angle method at sunset or sunrise without artificial illumination; the preparation for the observation consists in computing in advance the approximate settings in azimuth and altitude in order to find Polaris, and the plan contemplates an approximate reference meridian: with the time of sunset or sunrise assumed as the time of observation, the hour angle "t" and azimuth "A" are determined in order to find the position of Polaris in azimuth; the position in altitude or vertical angle is found by taking the latitude of the station to which there is to be added or subtracted the angular amount that Polaris is above or below the pole at the assumed hour angle, above for less than 6 hours, and below when over 6 hours; these values are tabulated in the Ephemeris as an adjustment to the elevation of the pole in the table "To find the latitude by an altitude observation of Polaris at any hour angle."

CONVERGENCY OF MERIDIANS.

"m_λ": Measurement along the parallel.

"m_ϕ": Measurement along the meridian.

"a": Equatorial radius of the earth = 3963.3 miles = 80×3963.3 chains.

"e": Factor of eccentricity, log e = 8.915 2515.

"dm_λ": Linear amount of the convergency on the parallel, of two meridians distance apart "m_λ," and distance "m_ϕ" along the meridian: "dm_λ," "m_λ," "m_ϕ" and "a" to be expressed in the same unit:

$$dm_\lambda = \frac{m_\lambda\,m_\phi}{a}\,\tan\,\phi\,\sqrt{1-e^2\,\sin^2\,\phi}$$

TABLE 26.—INCREMENTS OF CURVATURE

Change in azimuth due to convergency of meridians

Lat.	Departure in chains										Lat.
	10	20	30	40	50	60	70	80	90	100	
°	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	°
25	0 3	0 6	0 9	0 12	0 15	0 18	0 21	0 24	0 27	0 30	25
26	0 3	0 6	0 10	0 13	0 16	0 19	0 22	0 25	0 28	0 32	26
27	0 3	0 7	0 10	0 13	0 17	0 20	0 23	0 26	0 30	0 33	27
28	0 4	0 7	0 10	0 14	0 17	0 21	0 24	0 28	0 31	0 35	28
29	0 4	0 7	0 11	0 14	0 18	0 22	0 25	0 29	0 32	0 36	29
30	0 4	0 8	0 11	0 15	0 19	0 22	0 26	0 30	0 34	0 38	30
31	0 4	0 8	0 12	0 16	0 20	0 23	0 27	0 31	0 35	0 39	31
32	0 4	0 8	0 12	0 16	0 20	0 24	0 28	0 32	0 37	0 41	32
33	0 4	0 8	0 13	0 17	0 21	0 25	0 30	0 34	0 38	0 42	33
34	0 4	0 9	0 13	0 18	0 22	0 26	0 31	0 35	0 39	0 44	34
35	0 5	0 9	0 14	0 18	0 23	0 27	0 32	0 36	0 41	0 46	35
36	0 5	0 9	0 14	0 19	0 24	0 28	0 33	0 38	0 42	0 47	36
37	0 5	0 10	0 15	0 20	0 24	0 29	0 34	0 39	0 44	0 49	37
38	0 5	0 10	0 15	0 20	0 25	0 30	0 36	0 41	0 46	0 51	38
39	0 5	0 10	0 16	0 21	0 26	0 32	0 37	0 42	0 47	0 53	39
40	0 6	0 11	0 16	0 22	0 27	0 33	0 38	0 44	0 49	0 54	40
41	0 6	0 11	0 17	0 23	0 28	0 34	0 40	0 45	0 51	0 56	41
42	0 6	0 12	0 18	0 23	0 29	0 35	0 41	0 47	0 53	0 58	42
43	0 6	0 12	0 18	0 24	0 30	0 36	0 42	0 48	0 54	1 1	43
44	0 6	0 12	0 19	0 25	0 31	0 38	0 44	0 50	0 56	1 3	44
45	0 6	0 13	0 20	0 26	0 32	0 39	0 46	0 52	0 58	1 5	45
46	0 7	0 13	0 20	0 27	0 34	0 40	0 47	0 54	1 0	1 7	46
47	0 7	0 14	0 21	0 28	0 35	0 42	0 49	0 56	1 3	1 10	47
48	0 7	0 14	0 22	0 29	0 36	0 43	0 50	0 58	1 5	1 12	48
49	0 8	0 15	0 22	0 30	0 37	0 45	0 52	1 0	1 7	1 15	49
50	0 8	0 16	0 23	0 30	0 39	0 46	0 54	1 2	1 10	1 17	50
51	0 8	0 16	0 24	0 32	0 40	0 48	0 56	1 4	1 12	1 20	51
52	0 8	0 17	0 25	0 33	0 42	0 50	0 58	1 6	1 15	1 23	52
53	0 9	0 17	0 26	0 34	0 43	0 52	1 0	1 9	1 18	1 26	53
54	0 9	0 18	0 27	0 36	0 45	0 54	1 2	1 12	1 20	1 29	54
55	0 9	0 18	0 28	0 37	0 46	0 56	1 5	1 14	1 23	1 33	55
56	0 10	0 19	0 29	0 38	0 48	0 58	1 7	1 17	1 27	1 36	56
57	0 10	0 20	0 30	0 40	0 50	1 0	1 10	1 20	1 30	1 40	57
58	0 10	0 21	0 31	0 42	0 52	1 2	1 13	1 23	1 34	1 44	58
59	0 11	0 22	0 32	0 43	0 54	1 5	1 16	1 26	1 37	1 48	59
60	0 11	0 22	0 34	0 45	0 56	1 7	1 19	1 30	1 41	1 52	60
61	0 12	0 23	0 35	0 47	0 58	1 10	1 22	1 34	1 45	1 57	61
62	0 12	0 24	0 37	0 49	1 1	1 13	1 25	1 38	1 50	2 2	62
63	0 13	0 26	0 38	0 51	1 4	1 16	1 29	1 42	1 55	2 7	63
64	0 13	0 27	0 40	0 53	1 6	1 20	1 33	1 46	2 0	2 13	64
65	0 14	0 28	0 42	0 56	1 10	1 24	1 37	1 51	2 5	2 19	65
66	0 15	0 29	0 44	0 58	1 13	1 27	1 42	1 57	2 11	2 26	66
67	0 15	0 31	0 46	1 1	1 16	1 32	1 47	2 2	2 18	2 33	67
68	0 16	0 32	0 48	1 4	1 20	1 36	1 52	2 8	2 24	2 40	68
69	0 17	0 34	0 51	1 8	1 24	1 41	1 58	2 15	2 32	2 49	69
70	0 18	0 36	0 54	1 11	1 29	1 47	2 5	2 23	2 40	2 58	70

TABLE 27.—THE ARPENT AND VARA UNITS.[1]

ARPENTS TO ACRES

The arpent (*arpen*) is an old French land measure of *area* whose use was employed wherever there were French settlements in North America. The arpent seems never to have been used directly as a linear measure, but tracts of land were frequently described in length and breadth in terms of arpents, the unit intended being the length of the side of a square arpent. The values given below were employed with considerable uniformity, differing only slightly as to exactness, but with the distinction as noted.

The value in Louisiana, Mississippi, Alabama, and Northwestern Florida:

1 arpent=0.84625 acres (very nearly).
The side of a square arpent=2.909 chains=191.994 feet.

The value in Arkansas and Missouri:

1 arpent=0.8507 acres.
The side of a square arpent=2.91667 chains=192.500 feet.

VARAS TO CHAINS AND FEET

The vara is a Spanish and Mexican unit of linear measurement.

The value in the public domain of the Southwest:

1 vara=32.99312 inches=4.1658 links.
100 varas=4.1658 chains=274.943 feet.

The value in Florida:

1 vara=33.372 inches=4.2136 links.
100 varas=4.2136 chains=278.100 feet.

The value in Texas:

1 vara=33.333333 inches=4.2088 links.
100 varas=4.208754 chains=277.777 feet.
36 varas=1.5152 chains=100.000 feet.
1900.8 varas=80.00 chains=5280 feet=1 mile.
75.13 varas square=5645.375 square varas=1 acre.

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[1] In some cases slightly different values were employed in the boundary surveys of the French, Spanish, and Mexican land grants in the several surveying districts, due no doubt to the lack of exact standards, the disposition to continue the established local practices, and more or less on account of the use of approximate conversion factors, so that if it is necessary to ascertain the authority for definite equivalents an examination should be made of the early surveying records and court opinions of that particular district.

TABLE 28.—METRIC CONVERSIONS

CONVERSION TABLES

Metric Linear Units

ONE METER is equivalent to:

Links 4.970 960	Feet 3.280 833	Inches 39.37
Log. 0.696 440	Log. 0.515 984	Log. 1.595 165

LINKS TO FEET TO METERS

Links	Feet	Meters
1	.660	.201 168
2	1.320	.402 337
3	1.980	.603 505
4	2.640	.804 674
5	3.300	1.005 842
6	3.960	1.207 010
7	4.620	1.408 179
8	5.280	1.609 347
9	5.940	1.810 516
10	6.600	2.011 684

METERS TO FEET TO LINKS

Meters	Feet	Links
1	3.280 833	4.970 960
2	6.561 667	9.941 919
3	9.842 500	14.912 879
4	13.123 333	19.883 838
5	16.404 167	24.854 798
6	19.685 000	29.825 758
7	22.965 833	34.796 717
8	26.246 667	39.767 677
9	29.527 500	44.738 636
10	32.808 333	49.709 596

FEET TO LINKS TO METERS

Feet	Links	Meters
1	1.515 152	.304 801
2	3.030 303	.609 601
3	4.545 454	.914 402
4	6.060 606	1.219 202
5	7.575 758	1.524 003
6	9.090 909	1.828 804
7	10.606 060	2.133 604
8	12.121 212	2.438 405
9	13.636 364	2.743 205
10	15.151 515	3.048 006

TABLE 29.—CHAINS AND LINKS TO FEET.

Lks.	0 chs.	1 ch.	2 chs.	3 chs.	4 chs.	Lks.	0 chs.	1 ch.	2 chs.	3 chs.	4 chs.
	Feet	*Feet*	*Feet*	*Feet*	*Feet*		*Feet*	*Feet*	*Feet*	*Feet*	*Feet*
0	0.00	66.00	132.00	198.00	264.00	50	33.00	99.00	165.00	231.00	297.00
1	0.66	66.66	132.66	198.66	264.66	51	33.66	99.66	165.66	231.66	297.66
2	1.32	67.32	133.32	199.32	265.32	52	34.32	100.32	166.32	232.32	298.32
3	1.98	67.98	133.98	199.98	265.98	53	34.98	100.98	166.98	232.98	298.98
4	2.64	68.64	134.64	200.64	266.64	54	35.64	101.64	167.64	233.64	299.64
5	3.30	69.30	135.30	201.30	267.30	55	36.30	102.30	168.30	234.30	300.30
6	3.96	69.96	135.96	201.96	267.96	56	36.96	102.96	168.96	234.96	300.96
7	4.62	70.62	136.62	202.62	268.62	57	37.62	103.62	169.62	235.62	301.62
8	5.28	71.28	137.28	203.28	269.28	58	38.28	104.28	170.28	236.28	302.28
9	5.94	71.94	137.94	203.94	269.94	59	38.94	104.94	170.94	236.94	302.94
10	6.60	72.60	138.60	204.60	270.60	60	39.60	105.60	171.60	237.60	303.60
11	7.26	73.26	139.26	205.26	271.26	61	40.26	106.26	172.26	238.26	304.26
12	7.92	73.92	139.92	205.92	271.92	62	40.92	106.92	172.92	238.92	304.92
13	8.58	74.58	140.58	206.58	272.58	63	41.58	107.58	173.58	239.58	305.58
14	9.24	75.24	141.24	207.24	273.24	64	42.24	108.24	174.24	240.24	306.24
15	9.90	75.90	141.90	207.90	273.90	65	42.90	108.90	174.90	240.90	306.90
16	10.56	76.56	142.56	208.56	274.56	66	45.56	109.56	175.56	241.56	307.56
17	11.22	77.22	143.22	209.22	275.22	67	44.22	110.22	176.22	242.22	308.22
18	11.88	77.88	143.88	209.88	275.88	68	44.88	110.88	176.88	242.88	308.88
19	12.54	78.54	144.54	210.54	276.54	69	45.54	111.54	177.54	243.54	309.54
20	13.20	79.20	145.20	211.20	277.20	70	46.20	112.20	178.20	244.20	310.20
21	13.86	79.86	145.86	211.86	277.86	71	46.86	112.86	178.86	244.86	310.86
22	14.52	80.52	146.52	212.52	278.52	72	47.52	113.52	179.52	245.52	311.52
23	15.18	81.18	147.18	213.18	279.18	73	48.18	114.18	180.18	246.18	312.18
24	15.84	81.84	147.84	213.84	279.84	74	48.84	114.84	180.84	246.84	312.84
25	16.50	82.50	148.50	214.50	280.50	75	49.50	115.50	181.50	247.50	313.50
26	17.16	83.16	149.16	215.16	281.16	76	50.16	116.16	182.16	248.16	314.16
27	17.82	83.82	149.82	215.82	281.82	77	50.82	116.82	182.82	248.82	314.82
28	18.48	84.48	150.48	216.48	282.48	78	51.48	117.48	183.48	249.48	315.48
29	19.14	85.14	151.14	217.14	283.14	79	52.14	118.14	184.14	250.14	316.14
30	19.80	85.80	151.80	217.80	283.80	80	52.80	118.80	184.80	250.80	316.80
31	20.46	86.46	152.46	218.46	284.46	81	53.46	119.46	185.46	251.46	317.46
32	21.12	87.12	153.12	219.12	285.12	82	54.12	120.12	186.12	252.12	318.12
33	21.78	87.78	153.78	219.78	285.78	83	54.78	120.78	186.78	252.78	318.78
34	22.44	88.44	154.44	220.44	286.44	84	55.44	121.44	187.44	253.44	319.44
35	23.10	89.10	155.10	221.10	287.10	85	56.10	122.10	188.10	254.10	320.10
36	23.76	89.76	155.76	221.76	287.76	86	56.76	122.76	188.76	254.76	320.76
37	24.42	90.42	156.42	222.42	288.42	87	57.42	123.42	189.42	255.42	321.42
38	25.08	91.08	157.08	223.08	289.08	88	58.08	124.08	190.08	256.08	322.08
39	25.74	91.74	157.74	223.74	289.74	89	58.74	124.74	190.74	256.74	322.74
40	26.40	92.40	158.40	224.40	290.40	90	59.40	125.40	191.40	257.40	323.40
41	27.06	93.06	159.06	225.06	291.06	91	60.06	126.06	192.06	258.06	324.06
42	27.72	93.72	159.72	225.72	291.72	92	60.72	126.72	192.72	258.72	324.72
43	28.38	94.38	160.38	226.38	292.38	93	61.38	127.38	193.38	259.38	325.38
44	29.04	95.04	161.04	227.04	293.04	94	62.04	128.04	194.04	260.04	326.04
45	29.70	95.70	161.70	227.70	293.70	95	62.70	128.70	194.70	260.70	326.70
46	30.36	96.36	162.36	228.36	294.36	96	63.36	129.36	195.36	261.36	327.36
47	31.02	97.02	163.02	229.02	295.02	97	64.02	130.02	196.02	262.02	328.02
48	31.68	97.68	163.68	229.68	295.68	98	64.68	130.68	196.68	262.68	328.68
49	32.34	98.34	164.34	230.34	296.34	99	65.34	131.34	197.34	263.34	329.34
50	33.00	99.00	165.00	231.00	297.00	100	66.00	132.00	198.00	264.00	330.00

For conversion of even or whole chains, up to 100 chains, use columns zero chains and links, and place decimal two points to the right.

TABLE 29.—CHAINS AND LINKS TO FEET.

Lks.	5 chs.	6 chs.	7 chs.	8 chs.	9 chs.	Lks.	5 chs.	6 chs.	7 chs.	8 chs.	9 chs.
	Feet	*Feet*	*Feet*	*Feet*	*Feet*		*Feet*	*Feet*	*Feet*	*Feet*	*Feet*
0	330.00	396.00	462.00	528.00	594.00	50	363.00	429.00	495.00	561.00	627.00
1	330.66	396.66	462.66	528.66	594.66	51	363.66	429.66	495.66	561.66	627.66
2	331.32	397.32	463.32	529.32	595.32	52	364.32	430.32	496.32	562.32	628.32
3	331.98	397.98	463.98	529.98	595.98	53	364.98	430.98	496.98	562.98	628.98
4	332.64	398.64	464.64	530.64	596.64	54	365.64	431.64	497.64	563.64	629.64
5	333.30	399.30	465.30	531.30	597.30	55	366.30	432.30	498.30	564.30	630.30
6	333.96	399.96	465.96	531.96	597.96	56	366.96	432.96	498.96	564.96	630.96
7	334.62	400.62	466.62	532.62	598.62	57	367.62	433.62	499.62	565.62	631.62
8	335.28	401.28	467.28	533.28	599.28	58	368.28	434.28	500.28	566.28	632.28
9	335.94	401.94	467.94	533.94	599.94	59	368.94	434.94	500.94	566.94	632.94
10	336.60	402.60	468.60	534.60	600.60	60	369.60	435.60	501.60	567.60	633.60
11	337.26	403.26	469.26	535.26	601.26	61	370.26	436.26	502.26	568.26	634.26
12	337.92	403.92	469.92	535.92	601.92	62	370.92	436.92	502.92	568.92	634.92
13	338.58	404.58	470.58	536.58	602.58	63	371.58	437.58	503.58	569.58	635.58
14	339.24	405.24	471.24	537.24	603.24	64	372.24	438.24	504.24	570.24	636.24
15	339.90	405.90	471.90	537.90	603.90	65	372.90	438.90	504.90	570.90	636.90
16	340.56	406.56	472.56	538.56	604.56	66	373.56	439.56	505.56	571.56	637.56
17	341.22	407.22	473.22	539.22	605.22	67	374.22	440.22	506.22	572.22	638.22
18	341.88	407.88	473.88	539.88	605.88	68	374.88	440.88	506.88	572.88	638.88
19	342.54	408.54	474.54	540.54	606.54	69	375.54	441.54	507.54	573.54	639.54
20	343.20	409.20	475.20	541.20	607.20	70	376.20	442.20	508.20	574.20	640.20
21	343.86	409.86	475.86	541.86	607.86	71	376.86	442.86	508.86	574.86	640.86
22	344.52	410.52	476.52	542.52	608.52	72	377.52	443.52	509.52	575.52	641.52
23	345.18	411.18	477.18	543.18	609.18	73	378.18	444.18	510.18	576.18	642.18
24	345.84	411.84	477.84	543.84	609.84	74	378.84	444.84	510.84	576.84	642.84
25	346.50	412.50	478.50	544.50	610.50	75	379.50	445.50	511.50	577.50	643.50
26	347.16	413.16	479.16	545.16	611.16	76	380.16	446.16	512.16	578.16	644.16
27	347.82	413.82	479.82	545.82	611.82	77	380.82	446.82	512.82	578.82	644.82
28	348.48	414.48	480.48	546.48	612.48	78	381.48	447.48	513.48	579.48	645.48
29	349.14	415.14	481.14	547.14	613.14	79	382.14	448.14	514.14	580.14	646.14
30	349.80	415.80	481.80	547.80	613.80	80	382.80	448.80	514.80	580.80	646.80
31	350.46	416.46	482.46	548.46	614.46	81	383.46	449.46	515.46	581.46	647.46
32	351.12	417.12	483.12	549.12	615.12	82	384.12	450.12	516.12	582.12	648.12
33	351.78	417.78	483.78	549.78	615.78	83	384.78	450.78	516.78	582.78	648.78
34	352.44	418.44	484.44	550.44	616.44	84	385.44	451.44	517.44	583.44	649.44
35	353.10	419.10	485.10	551.10	617.10	85	386.10	452.10	518.10	584.10	650.10
36	353.76	419.76	485.76	551.76	617.76	86	386.76	452.76	518.76	584.76	650.76
37	354.42	420.42	486.42	552.42	618.42	87	387.42	453.42	519.42	585.42	651.42
38	355.08	421.08	487.08	553.08	619.08	88	388.08	454.08	520.08	586.08	652.08
39	355.74	421.74	487.74	553.74	619.74	89	388.74	454.74	520.74	586.74	652.74
40	356.40	422.40	488.40	554.40	620.40	90	389.40	455.40	521.40	587.40	653.40
41	357.06	423.06	489.06	555.06	621.06	91	390.06	456.06	522.06	588.06	654.06
42	357.72	423.72	489.72	555.72	621.72	92	390.72	456.72	522.72	588.72	654.72
43	358.38	424.38	490.38	556.38	622.38	93	391.38	457.38	523.38	589.38	655.38
44	359.04	425.04	491.04	557.04	623.04	94	392.04	458.04	524.04	590.04	656.04
45	359.70	425.70	491.70	557.70	623.70	95	392.70	458.70	524.70	590.70	656.70
46	360.36	426.36	492.36	558.36	624.36	96	393.36	459.36	525.36	591.36	657.36
47	361.02	427.02	493.02	559.02	625.02	97	394.02	460.02	526.02	592.02	658.02
48	361.68	427.68	493.68	559.68	625.68	98	394.68	460.68	526.68	592.68	658.68
49	362.34	428.34	494.34	560.34	626.34	99	395.34	461.34	527.34	593.34	659.34
50	363.00	429.00	495.00	561.00	627.00	100	396.00	462.00	528.00	594.00	660.00

For conversion of even or whole chains, up to 1000 chains, use columns chains and links, and place decimal two points to the right.

TABLE 30.—FEET TO CHAINS AND LINKS.

Ft.	000 ft.	100 ft.	200 ft.	300 ft.	400 ft.	Ft.	000 ft.	100 ft.	200 ft.	300 ft.	400 ft.
	Chains	*Chains*	*Chains*	*Chains*	*Chains*		*Chains*	*Chains*	*Chains*	*Chains*	*Chains*
0	0. 00[0]	1. 51[5]	3. 03[0]	4. 54[5]	6. 06[1]	50	0. 75[8]	2. 27[3]	3. 78[8]	5. 30[3]	6. 81[8]
1	0. 01[5]	1. 53[0]	3. 04[5]	4. 56[1]	6. 07[6]	51	0. 77[3]	2. 28[8]	3. 80[3]	5. 31[8]	6. 83[3]
2	0. 03[0]	1. 54[5]	3. 06[1]	4. 57[6]	6. 09[1]	52	0. 78[8]	2. 30[3]	3. 81[8]	5. 33[3]	6. 84[8]
3	0. 04[5]	1. 56[1]	3. 07[6]	4. 59[1]	6. 10[6]	53	0. 80[3]	2. 31[8]	3. 83[3]	5. 34[8]	6. 86[4]
4	0. 06[1]	1. 57[6]	3. 09[1]	4. 60[6]	6. 12[1]	54	0. 81[8]	2. 33[3]	3. 84[8]	5. 36[4]	6. 87[9]
5	0. 07[6]	1. 59[1]	3. 10[6]	4. 62[1]	6. 13[6]	55	0. 83[3]	2. 34[8]	3. 86[4]	5. 37[9]	6. 89[4]
6	0. 09[1]	1. 60[6]	3. 12[1]	4. 63[6]	6. 15[2]	56	0. 84[8]	2. 36[4]	3. 87[9]	5. 39[4]	6. 90[9]
7	0. 10[6]	1. 62[1]	3. 13[6]	4. 65[2]	6. 16[7]	57	0. 86[4]	2. 37[9]	3. 89[4]	5. 40[9]	6. 92[4]
8	0. 12[1]	1. 63[6]	3. 15[2]	4. 66[7]	6. 18[2]	58	0. 87[9]	2. 39[4]	3. 90[9]	5. 42[4]	6. 93[9]
9	0. 13[6]	1. 65[2]	3. 16[7]	4. 68[2]	6. 19[7]	59	0. 89[4]	2. 40[9]	3. 92[4]	5. 43[9]	6. 95[5]
10	0. 15[2]	1. 66[7]	3. 18[2]	4. 69[7]	6. 21[2]	60	0. 90[9]	2. 42[4]	3. 93[9]	5. 45[5]	6. 97[0]
11	0. 16[7]	1. 68[2]	3. 19[7]	4. 71[2]	6. 22[7]	61	0. 92[4]	2. 43[9]	3. 95[5]	5. 47[0]	6. 98[5]
12	0. 18[2]	1. 69[7]	3. 21[2]	4. 72[7]	6. 24[2]	62	0. 93[9]	2. 45[5]	3. 97[0]	5. 48[5]	7. 00[0]
13	0. 19[7]	1. 71[2]	3. 22[7]	4. 74[2]	6. 25[8]	63	0. 95[5]	2. 47[0]	3. 98[5]	5. 50[0]	7. 01[5]
14	0. 21[2]	1. 72[7]	3. 24[2]	4. 75[8]	6. 27[3]	64	0. 97[0]	2. 48[5]	4. 00[0]	5. 51[5]	7. 03[0]
15	0. 22[7]	1. 74[2]	3. 25[8]	4. 77[3]	6. 28[8]	65	0. 98[5]	2. 50[0]	4. 01[5]	5. 53[0]	7. 04[5]
16	0. 24[2]	1. 75[8]	3. 27[3]	4. 78[8]	6. 30[3]	66	1. 00[0]	2. 51[5]	4. 03[0]	5. 54[5]	7. 06[1]
17	0. 25[8]	1. 77[3]	3. 28[8]	4. 80[3]	6. 31[8]	67	1. 01[5]	2. 53[0]	4. 04[5]	5. 56[1]	7. 07[6]
18	0. 27[3]	1. 78[8]	3. 30[3]	4. 81[8]	6. 33[3]	68	1. 03[0]	2. 54[5]	4. 06[1]	5. 57[6]	7. 09[1]
19	0. 28[8]	1. 80[3]	3. 31[8]	4. 83[3]	6. 34[8]	69	1. 04[5]	2. 56[1]	4. 07[6]	5. 59[1]	7. 10[6]
20	0. 30[3]	1. 81[8]	3. 33[3]	4. 84[8]	6. 36[4]	70	1. 06[1]	2. 57[6]	4. 09[1]	5. 60[6]	7. 12[1]
21	0. 31[8]	1. 83[3]	3. 34[8]	4. 86[4]	6. 37[9]	71	1. 07[6]	2. 59[1]	4. 10[6]	5. 62[1]	7. 13[6]
22	0. 33[3]	1. 84[8]	3. 36[4]	4. 87[9]	6. 39[4]	72	1. 09[1]	2. 60[6]	4. 12[1]	5. 63[6]	7. 15[2]
23	0. 34[8]	1. 86[4]	3. 37[9]	4. 89[4]	6. 40[9]	73	1. 10[6]	2. 62[1]	4. 13[6]	5. 65[2]	7. 16[7]
24	0. 36[4]	1. 87[9]	3. 39[4]	4. 90[9]	6. 42[4]	74	1. 12[1]	2. 63[6]	4. 15[2]	5. 66[7]	7. 18[2]
25	0. 37[9]	1. 89[4]	3. 40[9]	4. 92[4]	6. 43[9]	75	1. 13[6]	2. 65[2]	4. 16[7]	5. 68[2]	7. 19[7]
26	0. 39[4]	1. 90[9]	3. 42[4]	4. 93[9]	6. 45[5]	76	1. 15[2]	2. 66[7]	4. 18[2]	5. 69[7]	7. 21[2]
27	0. 40[9]	1. 92[4]	3. 43[9]	4. 95[5]	6. 47[0]	77	1. 16[7]	2. 68[2]	4. 19[7]	5. 71[2]	7. 22[7]
28	0. 42[4]	1. 93[9]	3. 45[5]	4. 97[0]	6. 48[5]	78	1. 18[2]	2. 69[7]	4. 21[2]	5. 72[7]	7. 24[2]
29	0. 43[9]	1. 95[5]	3. 47[0]	4. 98[5]	6. 50[0]	79	1. 19[7]	2. 71[2]	4. 22[7]	5. 74[2]	7. 25[8]
30	0. 45[5]	1. 97[0]	3. 48[5]	5. 00[0]	6. 51[5]	80	1. 21[2]	2. 72[7]	4. 24[2]	5. 75[8]	7. 27[3]
31	0. 47[0]	1. 98[5]	3. 50[0]	5. 01[5]	6. 53[0]	81	1. 22[7]	2. 74[2]	4. 25[8]	5. 77[3]	7. 28[8]
32	0. 48[5]	2. 00[0]	3. 51[5]	5. 03[0]	6. 54[5]	82	1. 24[2]	2. 75[8]	4. 27[3]	5. 78[8]	7. 30[3]
33	0. 50[0]	2. 01[5]	3. 53[0]	5. 04[5]	6. 56[1]	83	1. 25[8]	2. 77[3]	4. 28[8]	5. 80[3]	7. 31[8]
34	0. 51[5]	2. 03[0]	3. 54[5]	5. 06[1]	6. 57[6]	84	1. 27[3]	2. 78[8]	4. 30[3]	5. 81[8]	7. 33[3]
35	0. 53[0]	2. 04[5]	3. 56[1]	5. 07[6]	6. 59[1]	85	1. 28[8]	2. 80[3]	4. 31[8]	5. 83[3]	7. 34[8]
36	0. 54[5]	2. 06[1]	3. 57[6]	5. 09[1]	6. 60[6]	86	1. 30[3]	2. 81[8]	4. 33[3]	5. 84[8]	7. 36[4]
37	0. 56[1]	2. 07[6]	3. 59[1]	5. 10[6]	6. 62[1]	87	1. 31[8]	2. 83[3]	4. 34[8]	5. 86[4]	7. 37[9]
38	0. 57[6]	2. 09[1]	3. 60[6]	5. 12[1]	6. 63[6]	88	1. 33[3]	2. 84[8]	4. 36[4]	5. 87[9]	7. 39[4]
39	0. 59[1]	2. 10[6]	3. 62[1]	5. 13[6]	6. 65[2]	89	1. 34[8]	2. 86[4]	4. 37[9]	5. 89[4]	7. 40[9]
40	0. 60[6]	2. 12[1]	3. 63[6]	5. 15[2]	6. 66[7]	90	1. 36[4]	2. 87[9]	4. 39[4]	5. 90[9]	7. 42[4]
41	0. 62[1]	2. 13[6]	3. 65[2]	5. 16[7]	6. 68[2]	91	1. 37[9]	2. 89[4]	4. 40[9]	5. 92[4]	7. 43[9]
42	0. 63[6]	2. 15[2]	3. 66[7]	5. 18[2]	6. 69[7]	92	1. 39[4]	2. 90[9]	4. 42[4]	5. 93[9]	7. 45[5]
43	0. 65[2]	2. 16[7]	3. 68[2]	5. 19[7]	6. 71[2]	93	1. 40[9]	2. 92[4]	4. 43[9]	5. 95[5]	7. 47[0]
44	0. 66[7]	2. 18[2]	3. 69[7]	5. 21[2]	6. 72[7]	94	1. 42[4]	2. 93[9]	4. 45[5]	5. 97[0]	7. 48[5]
45	0. 68[2]	2. 19[7]	3. 71[2]	5. 22[7]	6. 74[2]	95	1. 43[9]	2. 95[5]	4. 47[0]	5. 98[5]	7. 50[0]
46	0. 69[7]	2. 21[2]	3. 72[7]	5. 24[2]	6. 75[8]	96	1. 45[5]	2. 97[0]	4. 48[5]	6. 00[0]	7. 51[5]
47	0. 71[2]	2. 22[7]	3. 74[2]	5. 25[8]	6. 77[3]	97	1. 47[0]	2. 98[5]	4. 50[0]	6. 01[5]	7. 53[0]
48	0. 72[7]	2. 24[2]	3. 75[8]	5. 27[3]	6. 78[8]	98	1. 48[5]	3. 00[0]	4. 51[5]	6. 03[0]	7. 54[5]
49	0. 74[2]	2. 25[8]	3. 77[3]	5. 28[8]	6. 80[3]	99	1. 50[0]	3. 01[5]	4. 53[0]	6. 04[5]	7. 56[1]
50	0. 75[8]	2. 27[3]	3. 78[8]	5. 30[3]	6. 81[8]	100	1. 51[5]	3. 03[0]	4. 54[5]	6. 06[1]	7. 57[6]

Read the last figure as the nearest tenth of a link.

For conversion of hundredths of a foot, up to 1 foot, use the columns on the left and read as the equivalent in *links*, the last figure being the nearest thousandth of a link.

TABLE 30.—FEET TO CHAINS AND LINKS.

Ft.	500 ft.	600 ft.	700 ft.	800 ft.	900 ft.	Ft.	500 ft.	600 ft.	700 ft.	800 ft.	900 ft.
	Chains	*Chains*	*Chains*	*Chains*	*Chains*		*Chains*	*Chains*	*Chains*	*Chains*	*Chains*
0	7. 57^{6}	9. 09^{1}	10. 60^{5}	12. 12^{1}	13. 63^{6}	50	8. 33^{3}	9. 84^{8}	11. 36^{4}	12. 87^{9}	14. 39^{4}
1	7. 59^{1}	9. 10^{6}	10. 62^{1}	12. 13^{6}	13. 65^{2}	51	8. 34^{8}	9. 86^{4}	11. 37^{9}	12. 89^{4}	14. 40^{9}
2	7. 60^{6}	9. 12^{1}	10. 63^{6}	12. 15^{2}	13. 66^{7}	52	8. 36^{4}	9. 87^{9}	11. 39^{4}	12. 90^{9}	14. 42^{4}
3	7. 62^{1}	9. 13^{6}	10. 65^{2}	12. 16^{7}	13. 68^{2}	53	8. 37^{9}	9. 89^{4}	11. 40^{9}	12. 92^{4}	14. 43^{9}
4	7. 63^{6}	9. 15^{2}	10. 66^{7}	12. 18^{2}	13. 69^{7}	54	8. 39^{4}	9. 90^{9}	11. 42^{4}	12. 93^{9}	14. 45^{5}
5	7. 65^{2}	9. 16^{7}	10. 68^{2}	12. 19^{7}	13. 71^{2}	55	8. 40^{9}	9. 92^{4}	11. 43^{9}	12. 95^{5}	14. 47^{0}
6	7. 66^{7}	9. 18^{2}	10. 69^{7}	12. 21^{2}	13. 72^{7}	56	8. 42^{4}	9. 93^{9}	11. 45^{5}	12. 97^{0}	14. 48^{5}
7	7. 68^{2}	9. 19^{7}	10. 71^{2}	12. 22^{7}	13. 74^{2}	57	8. 43^{9}	9. 95^{5}	11. 47^{0}	12. 98^{5}	14. 50^{0}
8	7. 69^{7}	9. 21^{2}	10. 72^{7}	12. 24^{2}	13. 75^{8}	58	8. 45^{5}	9. 97^{0}	11. 48^{5}	13. 00^{0}	14. 51^{5}
9	7. 71^{2}	9. 22^{7}	10. 74^{2}	12. 25^{8}	13. 77^{3}	59	8. 47^{0}	9. 98^{5}	11. 50^{0}	13. 01^{5}	14. 53^{0}
10	7. 72^{7}	9. 24^{2}	10. 75^{8}	12. 27^{3}	13. 78^{8}	60	8. 48^{5}	10. 00^{0}	11. 51^{5}	13. 03^{0}	14. 54^{5}
11	7. 74^{2}	9. 25^{8}	10. 77^{3}	12. 28^{8}	13. 80^{3}	61	8. 50^{0}	10. 01^{5}	11. 53^{0}	13. 04^{5}	14. 56^{1}
12	7. 75^{8}	9. 27^{3}	10. 78^{8}	12. 30^{3}	13. 81^{8}	62	8. 51^{5}	10. 03^{0}	11. 54^{5}	13. 06^{1}	14. 57^{6}
13	7. 77^{3}	9. 28^{8}	10. 80^{3}	12. 31^{8}	13. 83^{3}	63	8. 53^{0}	10. 04^{5}	11. 56^{1}	13. 07^{6}	14. 59^{1}
14	7. 78^{8}	9. 30^{3}	10. 81^{8}	12. 33^{3}	13. 84^{8}	64	8. 54^{5}	10. 06^{1}	11. 57^{6}	13. 09^{1}	14. 60^{6}
15	7. 80^{3}	9. 31^{8}	10. 83^{3}	12. 34^{8}	13. 86^{4}	65	8. 56^{1}	10. 07^{6}	11. 59^{1}	13. 10^{6}	14. 62^{1}
16	7. 81^{8}	9. 33^{3}	10. 84^{8}	12. 36^{4}	13. 87^{9}	66	8. 57^{6}	10. 09^{1}	11. 60^{6}	13. 12^{1}	14. 63^{6}
17	7. 83^{3}	9. 34^{8}	10. 86^{4}	12. 37^{9}	13. 89^{4}	67	8. 59^{1}	10. 10^{6}	11. 62^{1}	13. 13^{6}	14. 65^{2}
18	7. 84^{8}	9. 36^{4}	10. 87^{9}	12. 39^{4}	13. 90^{9}	68	8. 60^{6}	10. 12^{1}	11. 63^{6}	13. 15^{2}	14. 66^{7}
19	7. 86^{4}	9. 37^{9}	10. 89^{4}	12. 40^{9}	13. 92^{4}	69	8. 62^{1}	10. 13^{6}	11. 65^{2}	13. 16^{7}	14. 68^{2}
20	7. 87^{9}	9. 39^{4}	10. 90^{9}	12. 42^{4}	13. 93^{9}	70	8. 63^{6}	10. 15^{2}	11. 66^{7}	13. 18^{2}	14. 69^{7}
21	7. 89^{4}	9. 40^{9}	10. 92^{4}	12. 43^{9}	13. 95^{5}	71	8. 65^{2}	10. 16^{7}	11. 68^{2}	13. 19^{7}	14. 71^{2}
22	7. 90^{9}	9. 42^{4}	10. 93^{9}	12. 45^{5}	13. 97^{0}	72	8. 66^{7}	10. 18^{2}	11. 69^{7}	13. 21^{2}	14. 72^{7}
23	7. 92^{4}	9. 43^{9}	10. 95^{5}	12. 47^{0}	13. 98^{5}	73	8. 68^{2}	10. 19^{7}	11. 71^{2}	13. 22^{7}	14. 74^{2}
24	7. 93^{9}	9. 45^{5}	10. 97^{0}	12. 48^{5}	14. 00^{0}	74	8. 69^{7}	10. 21^{2}	11. 72^{7}	13. 24^{2}	14. 75^{8}
25	7. 95^{5}	9. 47^{0}	10. 98^{5}	12. 50^{0}	14. 01^{5}	75	8. 71^{2}	10. 22^{7}	11. 74^{2}	13. 25^{8}	14. 77^{3}
26	7. 97^{0}	9. 48^{5}	11. 00^{0}	12. 51^{5}	14. 03^{0}	76	8. 72^{7}	10. 24^{2}	11. 75^{8}	13. 27^{3}	14. 78^{8}
27	7. 98^{5}	9. 50^{0}	11. 01^{5}	12. 53^{0}	14. 04^{5}	77	8. 74^{2}	10. 25^{8}	11. 77^{3}	13. 28^{8}	14. 80^{3}
28	8. 00^{0}	9. 51^{5}	11. 03^{0}	12. 54^{5}	14. 06^{1}	78	8. 75^{8}	10. 27^{3}	11. 78^{8}	13. 30^{3}	14. 81^{8}
29	8. 01^{5}	9. 53^{0}	11. 04^{5}	12. 56^{1}	14. 07^{6}	79	8. 77^{3}	10. 28^{8}	11. 80^{3}	13. 31^{8}	14. 83^{3}
30	8. 03^{0}	9. 54^{5}	11. 06^{1}	12. 57^{6}	14. 09^{1}	80	8. 78^{8}	10. 30^{3}	11. 81^{8}	13. 33^{3}	14. 84^{8}
31	8. 04^{5}	9. 56^{1}	11. 07^{6}	12. 59^{1}	14. 10^{6}	81	8. 80^{3}	10. 31^{8}	11. 83^{3}	13. 34^{8}	14. 86^{4}
32	8. 06^{1}	9. 57^{6}	11. 09^{1}	12. 60^{6}	14. 12^{1}	82	8. 81^{8}	10. 33^{3}	11. 84^{8}	13. 36^{4}	14. 87^{9}
33	8. 07^{6}	9. 59^{1}	11. 10^{6}	12. 62^{1}	14. 13^{6}	83	8. 83^{3}	10. 34^{8}	11. 86^{4}	13. 37^{9}	14. 89^{4}
34	8. 09^{1}	9. 60^{6}	11. 12^{1}	12. 63^{6}	14. 15^{2}	84	8. 84^{8}	10. 36^{4}	11. 87^{9}	13. 39^{4}	14. 90^{9}
35	8. 10^{6}	9. 62^{1}	11. 13^{6}	12. 65^{2}	14. 16^{7}	85	8. 86^{4}	10. 37^{9}	11. 89^{4}	13. 40^{9}	14. 92^{4}
36	8. 12^{1}	9. 63^{6}	11. 15^{2}	12. 66^{7}	14. 18^{2}	86	8. 87^{9}	10. 39^{4}	11. 90^{9}	13. 42^{4}	14. 93^{9}
37	8. 13^{6}	9. 65^{2}	11. 16^{7}	12. 68^{2}	14. 19^{7}	87	8. 89^{4}	10. 40^{9}	11. 92^{4}	13. 43^{9}	14. 95^{5}
38	8. 15^{2}	9. 66^{7}	11. 18^{2}	12. 69^{7}	14. 21^{2}	88	8. 90^{9}	10. 42^{4}	11. 93^{9}	13. 45^{5}	14. 97^{0}
39	8. 16^{7}	9. 68^{2}	11. 19^{7}	12. 71^{2}	14. 22^{7}	89	8. 92^{4}	10. 43^{9}	11. 95^{5}	13. 47^{0}	14. 98^{5}
40	8. 18^{2}	9. 69^{7}	11. 21^{2}	12. 72^{7}	14. 24^{2}	90	8. 93^{9}	10. 45^{5}	11. 97^{0}	13. 48^{5}	15. 00^{0}
41	8. 19^{7}	9. 71^{2}	11. 22^{7}	12. 74^{2}	14. 25^{8}	91	8. 95^{5}	10. 47^{0}	11. 98^{5}	13. 50^{0}	15. 01^{5}
42	8. 21^{2}	9. 72^{7}	11. 24^{2}	12. 75^{8}	14. 27^{3}	92	8. 97^{0}	10. 48^{5}	12. 00^{0}	13. 51^{5}	15. 03^{0}
43	8. 22^{7}	9. 74^{2}	11. 25^{8}	12. 77^{3}	14. 28^{8}	93	8. 98^{5}	10. 50^{0}	12. 01^{5}	13. 53^{0}	15. 04^{5}
44	8. 24^{2}	9. 75^{8}	11. 27^{3}	12. 78^{8}	14. 30^{3}	94	9. 00^{0}	10. 51^{5}	12. 03^{0}	13. 54^{5}	15. 06^{1}
45	8. 25^{8}	9. 77^{3}	11. 28^{8}	12. 80^{3}	14. 31^{8}	95	9. 01^{5}	10. 53^{0}	12. 04^{5}	13. 56^{1}	15. 07^{6}
46	8. 27^{3}	9. 78^{8}	11. 30^{3}	12. 81^{8}	14. 33^{3}	96	9. 03^{0}	10. 54^{5}	12. 06^{1}	13. 57^{6}	15. 09^{1}
47	8. 28^{8}	9. 80^{3}	11. 31^{8}	12. 83^{3}	14. 34^{8}	97	9. 04^{5}	10. 56^{1}	12. 07^{6}	13. 59^{1}	15. 10^{6}
48	8. 30^{3}	9. 81^{8}	11. 33^{3}	12. 84^{8}	14. 36^{4}	98	9. 06^{1}	10. 57^{6}	12. 09^{1}	13. 60^{6}	15. 12^{1}
49	8. 31^{8}	9. 83^{3}	11. 34^{8}	12. 86^{4}	14. 37^{9}	99	9. 07^{6}	10. 59^{1}	12. 10^{6}	13. 62^{1}	15. 13^{6}
50	8. 33^{3}	9. 84^{8}	11. 36^{4}	12. 87^{9}	14. 39^{4}	100	9. 09^{1}	10. 60^{6}	12. 12^{1}	13. 63^{6}	15. 15^{2}

Read the last figure as the nearest tenth of a link.

For conversion of even multiples of 1000 feet, employ Table 1, p. 5, feet to chains and place the decimal to the right as appropriate.

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS

The "M" factors are applied directly to measurements along a *meridian;* "P" factors to measurements along a *parallel.*

Reduce the traverse to equivalent latitudes and departures. Where there are abrupt changes (especially on long traverses), conversion should be made to each of the principal turning points.

The latitudes should be converted first, using the "M" factor for the point whose latitude is known. In converting the departures, use the "P" factor for the mean latitude.

The column headed $d\phi 5''$ supplies the differences in the "P" factor at intervals of 5" in latitude; intervals of 1, 2, 3, and 4" may be taken on the lines of 10, 20, 30, and 40', using one-tenth the value shown.

Lat.	nat M	nat P	Diff. nat P				$d\phi$ 5"	Lat.
			1'	2'	3'	4'		
° '								° '
25 0	.65380	.71738	10	19	29	38		25 0
5	80	786	10	20	29	39	1	5
10	79	835	10	20	29	39	2	10
15	78	884	10	20	29	39	2	15
20	78	932	10	20	30	40	3	20
25	77	982	10	20	30	40	4	25
30	.65376	.72032	10	20	30	40	5	30
35	75	082	10	20	30	40	6	35
40	74	132	10	20	30	40	7	40
45	74	182	10	20	30	40	8	45
50	73	232	10	20	31	41	8	50
55	72	283	10	20	31	41	9	55
26 0	.65372	.72334	10	21	31	41		26 0
5	71	385	10	21	31	41	1	5
10	70	437	10	21	31	41	2	10
15	69	488	10	21	31	41	3	15
20	68	540	10	21	31	42	4	20
25	68	592	10	21	31	42	5	25
30	.65367	.72644	11	21	32	42	6	30
35	66	697	11	21	32	42	6	35
40	65	750	11	21	32	43	7	40
45	64	803	11	21	32	43	8	45
50	64	856	11	21	32	43	9	50
55	63	909	11	21	32	43	10	55
27 0	.65362	.72963	11	22	32	43		27 0
5	61	.73017	11	22	32	43	1	5
10	60	071	11	22	32	43	2	10
15	60	125	11	22	33	44	3	15
20	59	180	11	22	33	44	4	20
25	58	235	11	22	33	44	5	25
30	.65357	.73290	11	22	33	44	6	30
35	56	345	11	22	33	44	6	35
40	56	401	11	22	34	45	7	40
45	55	457	11	22	34	45	8	45
50	54	513	11	22	34	45	9	50
55	53	569	11	23	34	45	10	55
28 0	.65353	.73625						28 0

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	nat M	nat P	Diff. nat P				$d\phi$ 5″	Lat.
			1′	2′	3′	4′		
° ′								° ′
28 0	.65353	.73625						28 0
5	52	682	11	23	34	45		5
10	51	739	11	23	34	45	1	10
15	51	796	11	23	34	46	2	15
20	50	854	11	23	34	46	3	20
25	49	912	11	23	34	46	4	25
30	.65348	.73970	12	23	35	46	5	30
35	47	.74028	12	23	35	46	6	35
40	46	086	12	23	35	47	7	40
45	45	145	12	23	35	47	8	45
50	45	204	12	23	35	47	9	50
55	44	263	12	24	36	48	10	55
			12	24	36	48	11	
29 0	.65343	.74323						29 0
5	42	383	12	24	36	48		5
10	41	443	12	24	36	48	1	10
15	41	503	12	24	36	48	2	15
20	40	563	12	24	36	48	3	20
25	39	624	12	24	36	49	4	25
30	.65338	.74685	12	25	37	49	5	30
35	37	746	12	25	37	49	6	35
40	36	808	12	25	37	49	7	40
45	35	870	12	25	37	50	8	45
50	35	932	12	25	37	50	9	50
55	34	.74994	12	25	37	50	10	55
			13	25	38	50	11	
30 0	.65333	.75056						30 0
5	32	119	13	25	38	50		5
10	31	182	13	25	38	51	1	10
15	31	246	13	25	38	51	2	15
20	30	309	13	25	38	51	3	20
25	29	372	13	26	38	51	4	25
30	.65328	.75437	13	26	38	51	5	30
35	27	502	13	26	39	52	6	35
40	26	567	13	26	39	52	8	40
45	25	632	13	26	39	52	9	45
50	25	697	13	26	39	52	10	50
55	24	762	13	26	39	52	11	55
			13	26	40	53	12	
31 0	.65323	.75828						31 0
5	22	894	13	26	40	53		5
10	21	.75961	13	27	40	53	1	10
15	20	.76027	13	27	40	53	2	15
20	20	094	13	27	40	53	4	20
25	19	161	13	27	40	54	5	25
30	.65318	.76229	13	27	40	54	6	30
35	17	297	14	27	41	54	7	35
40	16	365	14	27	41	54	8	40
45	15	433	14	27	41	54	9	45
50	14	501	14	27	41	55	10	50
55	13	571	14	28	42	55	12	55
			14	28	42	55	13	
32 0	.65313	.76640						32 0

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	nat M	nat P	Diff. nat P				$d\phi$ / 5″	Lat.
			1′	2′	3′	4′		
° ′								° ′
32 0	.65313	.76640	14	28	42	55		32 0
5	12	709	14	28	42	55	1	5
10	11	779	14	28	42	56	2	10
15	10	848	14	28	42	56	4	15
20	09	919	14	28	42	56	5	20
25	08	.76990	14	28	42	57	6	25
30	.65307	.77061	14	29	43	57	7	30
35	06	132	14	29	43	58	8	35
40	06	203	14	29	43	58	9	40
45	05	275	14	29	43	58	10	45
50	04	347	14	29	43	58	12	50
55	03	420	15	29	44	59	13	55
33 0	.65302	.77492	15	29	44	59		33 0
5	01	565	15	29	44	59	1	5
10	.65300	638	15	30	44	59	2	10
15	.65299	712	15	30	44	59	4	15
20	98	786	15	30	44	59	5	20
25	98	860	15	30	45	60	6	25
30	.65297	.77935	15	30	45	60	8	30
35	96	.78010	15	30	45	60	9	35
40	95	085	15	30	45	60	10	40
45	94	160	15	30	45	60	11	45
50	93	236	15	30	46	61	12	50
55	92	312	15	30	46	61	14	55
34 0	.65291	.78388	15	30	46	61		34 0
5	90	465	15	30	46	61	1	5
10	90	542	15	31	46	62	3	10
15	89	619	16	31	47	62	4	15
20	88	697	16	31	47	62	5	20
25	87	775	16	31	47	63	7	25
30	.65286	.78853	16	31	47	63	8	30
35	85	.78932	16	32	48	63	9	35
40	84	.79011	16	32	48	63	11	40
45	83	090	16	32	48	63	12	45
50	82	170	16	32	48	64	13	50
55	81	250	16	32	48	64	15	55
35 0	.65281	.79330	16	32	48	64		35 0
5	80	411	16	32	49	65	1	5
10	79	492	16	32	49	65	3	10
15	78	573	16	32	49	65	4	15
20	77	654	16	33	49	66	5	20
25	76	736	16	33	49	66	7	25
30	.65275	.79819	16	33	50	66	8	30
35	74	901	17	33	50	67	9	35
40	73	.79984	17	33	50	67	11	40
45	72	.80067	17	34	50	67	12	45
50	71	151	17	34	50	67	13	50
55	70	235	17	34	51	68	15	55
36 0	.65270	.80319						36 0

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	nat M	nat P	Diff. nat P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
36 0	.65270	.80319						36 0
5	69	404	17	34	51	68	1	5
10	68	489	17	34	51	68	3	10
15	67	575	17	34	51	68	4	15
20	66	660	17	34	51	69	6	20
25	65	746	17	35	52	69	7	25
30	.65264	.80833	17	35	52	69	8	30
35	63	.80919	17	35	52	69	10	35
40	62	.81006	17	35	52	70	11	40
45	61	094	18	35	53	70	13	45
50	60	182	18	35	53	70	14	50
55	59	270	18	35	53	71	16	55
37 0	.65258	.81359						37 0
5	58	448	18	36	53	71	2	5
10	57	537	18	36	53	71	3	10
15	56	627	18	36	54	72	4	15
20	55	717	18	36	54	72	6	20
25	54	808	18	36	54	72	8	25
30	.65253	.81898	18	36	54	72	9	30
35	52	.81989	18	36	55	73	10	35
40	51	.82081	18	37	55	73	12	40
45	50	173	18	37	55	73	14	45
50	49	265	18	37	55	74	15	50
55	48	358	19	37	56	74	16	55
38 0	.65247	.82451						38 0
5	46	545	19	37	56	75	2	5
10	45	639	19	37	56	75	3	10
15	44	733	19	38	57	76	5	15
20	44	827	19	38	57	76	6	20
25	43	.82922	19	38	57	76	8	25
30	.65242	.83018	19	38	57	77	10	30
35	41	114	19	38	57	77	11	35
40	40	210	19	39	58	77	13	40
45	39	307	19	39	58	77	14	45
50	38	404	19	39	58	78	16	50
55	37	501	20	39	59	78	17	55
39 0	.65236	.83599						39 0
5	35	697	20	39	59	79	2	5
10	34	796	20	39	59	79	3	10
15	33	895	20	40	59	80	5	15
20	32	.83995	20	40	59	80	7	20
25	31	.84095	20	40	60	80	8	25
30	.65230	.84195	20	40	60	80	10	30
35	29	295	20	40	60	80	12	35
40	28	397	20	41	61	81	13	40
45	27	498	20	41	61	81	15	45
50	26	600	20	41	61	81	17	50
55	26	702	20	41	61	82	18	55
			21	41	62	82		
40 0	.65225	.84805						40 0

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	nat M	nat P	Diff. nat P				$d\phi$ 5″	Lat.
			1′	2′	3′	4′		
° ′								° ′
40 0	.65225	.84805						40 0
5	24	.84909	21	41	62	83		5
10	23	.85013	21	41	62	83	2	10
15	22	117	21	42	63	83	4	15
20	21	221	21	42	63	83	5	20
25	20	326	21	42	63	84	7	25
30	.65219	.85432	21	42	63	84	9	30
35	18	538	21	43	64	85	10	35
40	17	644	21	43	64	85	12	40
45	16	751	21	43	64	86	14	45
50	15	858	21	43	64	86	16	50
55	14	.85966	22	43	65	86	18	55
			22	43	65	86	19	
41 0	.65213	.86074						41 0
5	12	183	22	44	65	87		5
10	11	292	22	44	65	87	2	10
15	10	401	22	44	66	88	4	15
20	09	511	22	44	66	88	6	20
25	08	622	22	44	66	88	7	25
30	.65207	.86733	22	45	67	89	9	30
35	06	844	22	45	67	89	11	35
40	05	.86956	22	45	67	90	13	40
45	05	.87069	22	45	67	90	15	45
50	04	181	23	45	68	90	16	50
55	03	295	23	45	68	91	18	55
			23	45	68	91	20	
42 0	.65202	.87408						42 0
5	01	523	23	46	69	91		5
10	200	637	23	46	69	92	2	10
15	199	753	23	46	69	92	4	15
20	98	868	23	46	69	92	6	20
25	97	.87985	23	46	70	93	8	25
30	.65196	.88101	23	47	70	93	10	30
35	95	219	23	47	70	94	12	35
40	94	336	23	47	70	94	13	40
45	93	455	24	47	71	95	15	45
50	92	573	24	48	71	95	17	50
55	91	693	24	48	72	96	19	55
			24	48	72	96	21	
43 0	.65190	.88812						43 0
5	89	.88933	24	48	72	97		5
10	88	.89054	24	48	72	97	2	10
15	87	175	24	48	72	97	4	15
20	86	297	24	49	73	98	6	20
25	85	419	24	49	73	98	8	25
30	.65184	.89542	25	49	74	99	10	30
35	83	666	25	49	74	99	12	35
40	82	789	25	49	74	99	15	40
45	81	.89914	25	50	75	100	17	45
50	80	.90039	25	50	75	100	19	50
55	79	165	25	50	76	101	21	55
			25	50	76	101	23	
44 0	.65178	.90291						44 0

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	nat M	nat P	Diff. nat P				$d\phi$ 5″	Lat.
			1′	2′	3′	4′		
° ′								° ′
44 0	.65178	.90291						44 0
5	78	417	25	51	76	101		5
10	77	544	25	51	76	101	2	10
15	76	672	26	51	77	102	4	15
20	75	800	26	51	77	102	6	20
25	74	.90929	26	51	77	103	9	25
30	.65173	.91059	26	52	78	104	11	30
35	72	189	26	52	78	104	13	35
40	71	319	26	52	78	104	15	40
45	70	450	26	53	79	105	17	45
50	69	582	26	53	79	106	20	50
55	68	714	26	53	79	106	22	55
			27	53	80	106	24	
45 0	.65167	.91847						45 0
5	66	.91980	27	53	80	107		5
10	65	.92114	27	54	80	107	2	10
15	64	249	27	54	81	108	4	15
20	63	384	27	54	81	108	7	20
25	62	520	27	54	82	109	9	25
30	.65161	.92657	27	55	82	109	11	30
35	60	793	27	55	82	109	14	35
40	59	.92931	28	55	83	110	16	40
45	58	.93069	28	55	83	110	18	45
50	57	209	28	55	83	111	20	50
55	56	347	28	56	84	111	22	55
			28	56	84	112	25	
46 0	.65155	.93488						46 0
5	54	628	28	56	84	112		5
10	53	770	28	56	85	113	2	10
15	52	.93911	28	57	85	114	5	15
20	51	.94054	29	57	86	114	7	20
25	51	197	29	57	86	115	10	25
30	.65150	.94341	29	58	86	115	12	30
35	49	485	29	58	86	115	14	35
40	48	630	29	58	87	116	17	40
45	47	776	29	58	88	117	19	45
50	46	.94923	29	59	88	117	22	50
55	45	.95070	29	59	88	118	24	55
			30	59	89	118	27	
47 0	.65144	.95218						47 0
5	43	365	30	59	89	118		5
10	42	515	30	60	89	119	2	10
15	41	664	30	60	90	120	5	15
20	40	815	30	60	90	120	8	20
25	39	.95966	30	60	91	121	10	25
30	.65138	.96118	30	61	91	121	12	30
35	37	270	30	61	91	122	15	35
40	36	423	31	61	92	122	18	40
45	35	577	31	62	92	123	20	45
50	34	732	31	62	93	124	22	50
55	33	.96887	31	62	93	124	25	55
			31	62	93	125	28	
48 0	.65132	.97042						48 0

TABLE 31.—NATURAL FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	nat M	nat P	Diff. nat P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
48 0	.65132	.97042						48 0
5	31	198	31	63	94	125	3	5
10	30	357	32	63	94	126	5	10
15	29	514	32	63	95	126	8	15
20	28	673	32	63	96	127	11	20
25	27	833	32	64	96	127	13	25
30	.65127	.97993	32	64	96	128	16	30
35	26	.98154	32	65	97	129	19	35
40	25	316	32	65	97	129	21	40
45	24	479	32	65	98	130	24	45
50	23	642	32	65	98	130	27	50
55	22	805	33	65	98	131	29	55
			33	66	99	132		
49 0	.65121	.98970						49 0
5	20	.99136	33	66	99	133	3	5
10	19	302	33	67	100	133	6	10
15	18	469	33	67	100	134	8	15
20	17	637	34	67	101	134	11	20
25	16	805	34	67	101	135	14	25
30	.65115	0.99975	34	68	102	136	17	30
35	14	1.00145	34	68	102	136	20	35
40	13	316	34	68	103	137	23	40
45	12	488	34	69	103	137	26	45
50	11	660	34	69	103	138	28	50
55	10	833	35	69	104	139	31	55
			35	70	105	139		
50 0	.65109	1.01008						50 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS

For explanation of use of tables see page 232.

Lat.	log M	log P	Diff. log P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
25 0	9.815448	9.855748						25 0
5	443	6041	58	117	176	235	5	5
10	438	6336	59	118	177	236	10	10
15	433	6632	59	118	177	237	15	15
20	428	6928	59	119	178	237	20	20
25	423	7226	60	119	179	238	25	25
30	9.815418	9.857526	60	120	180	239	30	30
35	413	7826	60	120	180	240	35	35
40	408	8127	60	121	181	241	40	40
45	403	8429	60	121	181	242	45	45
50	398	8733	61	121	182	243	50	50
55	393	9038	61	122	183	244	55	55
26 0	9.815388	9.859343	61	122	183	245		26 0
5	383	9650	61	123	184	246	5	5
10	378	.859958	62	123	185	246	10	10
15	373	.860268	62	124	186	247	16	15
20	368	0578	62	124	186	248	21	20
25	362	0890	62	125	187	249	26	25
30	9.815357	9.861202	63	125	188	250	32	30
35	352	1516	63	126	188	251	37	35
40	347	1831	63	126	189	252	42	30
45	342	2147	63	126	190	253	47	45
50	337	2464	63	127	190	254	52	50
55	332	2783	64	127	191	255	58	55
27 0	9.815326	9.863102	64	128	192	256		27 0
5	321	3423	64	128	192	257	5	5
10	316	3745	64	129	193	258	11	10
15	311	4068	65	129	194	258	16	15
20	306	4392	65	130	195	259	21	20
25	300	4717	65	130	195	260	27	25
30	9.815295	9.865044	65	131	196	261	33	30
35	290	5371	66	131	197	262	38	35
40	284	5700	66	132	197	263	44	40
45	279	6030	66	132	198	264	49	45
50	274	6361	66	132	199	265	55	50
55	269	6694	66	133	199	266	60	55
28 0	9.815263	9.867027	67	133	200	267		28 0
5	258	7362	67	134	201	268	6	5
10	253	7698	67	134	201	269	11	10
15	247	8035	67	135	202	270	17	15
20	242	8373	68	135	203	270	23	20
25	236	8712	68	136	204	272	28	25
30	9.815231	9.869053	68	136	204	272	34	30
35	226	9395	68	137	205	273	40	35
40	220	.869738	69	137	206	274	45	40
45	215	.870082	69	138	206	275	51	45
50	210	0427	69	138	207	276	57	50
55	204	0774	69	139	208	277	62	55
29 0	9.815199	9.871121	70	139	209	278		29 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	log M	log P	Diff. log P				dφ 5″	Lat.
			1′	2′	3′	4′		
° ′								° ′
29 0	9.815199	9.871121	70	140	209	279		29 0
5	193	1470	70	140	210	280	6	5
10	188	1820	70	141	211	281	12	10
15	182	2172	70	141	211	282	18	15
20	177	2524	71	142	212	283	24	20
25	171	2878	71	142	213	284	30	25
30	9.815166	9.873233	71	142	214	285	35	30
35	160	3589	71	143	214	286	41	35
40	155	3946	72	143	215	287	47	40
45	149	4305	72	144	216	288	53	45
50	144	4665	72	144	217	289	59	50
55	138	5026	72	145	217	290	65	55
30 0	9.815133	9.875388	73	145	218	291		30 0
5	127	5751	73	146	219	292	6	5
10	121	6116	73	146	219	293	12	10
15	116	6482	73	147	220	294	18	15
20	110	6849	74	147	221	295	25	20
25	105	7217	74	148	222	296	31	25
30	9.815099	9.877587	74	148	222	297	37	30
35	093	7958	74	149	223	298	43	35
40	088	8330	75	149	224	299	49	40
45	082	8703	75	150	225	300	56	45
50	076	9078	75	150	225	301	62	50
55	071	9453	75	151	226	302	68	55
31 0	9.815065	9.879830	76	151	227	303		31 0
5	060	.880209	76	152	228	304	6	5
10	054	0588	76	152	228	305	13	10
15	048	0969	76	153	229	306	19	15
20	042	1351	77	153	230	307	26	20
25	037	1734	77	154	231	308	32	25
30	9.815031	9.882119	77	154	231	309	38	30
35	025	2505	77	155	232	310	45	35
40	020	2892	78	155	233	311	51	40
45	014	3280	78	156	234	312	58	45
50	008	3670	78	156	235	313	64	50
55	.815002	4061	78	157	235	314	71	55
32 0	9.814996	9.884453	79	157	236	315		32 0
5	991	4846	79	158	237	316	7	5
10	985	5241	79	158	238	317	13	10
15	979	5637	79	159	238	318	20	15
20	973	6034	80	159	239	319	27	20
25	968	6432	80	160	240	320	33	25
30	9.814962	9.886832	80	160	241	321	40	30
35	956	7234	80	161	241	322	47	35
40	950	7636	81	161	242	323	53	40
45	944	8040	81	162	243	324	60	45
50	938	8444	81	163	244	325	67	50
55	932	8851	82	163	245	326	73	55
33 0	9.814927	9.889258						33 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	log M	log P	Diff. log P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
33 0	9.814927	9.889258	82	164	245	327		33 0
5	921	.889667	82	164	246	328	7	5
10	915	.890078	82	165	247	329	14	10
15	909	0489	83	165	248	330	21	15
20	903	0902	83	166	248	331	28	20
25	897	1316	83	166	249	332	35	25
30	9.814891	9.891732	83	167	250	333	41	30
35	885	2148	84	167	251	334	48	35
40	879	2566	84	168	252	336	55	40
45	873	2986	84	168	252	337	62	45
50	868	3406	84	169	253	338	69	50
55	862	3829	85	169	254	339	76	55
34 0	9.814856	9.894252	85	170	255	340		34 0
5	850	4677	85	170	256	341	7	5
10	844	5103	85	171	256	342	14	10
15	838	5530	86	171	257	343	22	15
20	832	5959	86	172	258	344	29	20
25	826	6389	86	173	259	345	36	25
30	9.814820	9.896820	87	173	260	346	43	30
35	814	7253	87	174	260	347	50	35
40	808	7687	87	174	261	348	58	40
45	802	8123	87	175	262	349	65	45
50	796	8560	88	175	263	351	72	50
55	790	8998	88	176	264	352	79	55
35 0	9.814784	9.899438	88	176	265	353		35 0
5	778	.899879	88	177	265	354	8	5
10	772	.900321	89	177	266	355	15	10
15	765	0765	89	178	267	356	22	15
20	759	1210	89	179	268	357	30	20
25	753	1656	90	179	269	358	38	25
30	9.814747	9.902104	90	180	269	359	45	30
35	741	2553	90	180	270	361	52	35
40	735	3004	90	181	271	362	60	40
45	729	3456	91	181	272	363	68	45
50	723	3909	91	182	273	364	75	50
55	717	4364	91	183	274	365	82	55
36 0	9.814711	9.904820	92	183	274	366		36 0
5	704	5278	92	184	275	367	8	5
10	698	5737	92	184	276	368	16	10
15	692	6197	92	185	277	369	23	15
20	686	6659	93	185	278	371	31	20
25	680	7122	93	186	279	372	39	25
30	9.814674	9.907587	93	186	280	373	46	30
35	668	8053	93	187	280	374	54	35
40	662	8520	94	188	281	375	62	40
45	655	8989	94	188	282	376	70	45
50	649	9460	94	189	283	377	77	50
55	643	.909931	95	189	284	379	85	55
37 0	9.814637	9.910405						37 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	log M	log P	Diff. log P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
37 0	9.814637	9.910405						37 0
5	631	0879	95	190	285	380	8	5
10	624	1355	95	190	286	381	16	10
15	618	1833	96	191	286	382	24	15
20	612	2312	96	192	287	383	32	20
25	606	2792	96	192	288	384	40	25
30	9.814600	9.913274	96	193	289	385	48	30
35	594	3758	97	193	290	387	56	35
40	587	4242	97	194	291	388	64	40
45	581	4729	97	195	292	389	72	45
50	575	5216	98	195	293	390	80	50
55	569	5706	98	196	293	391	88	55
			98	196	294	393		
38 0	9.814562	9.916196						38 0
5	556	6688	98	197	295	394	8	5
10	550	7182	99	197	296	395	17	10
15	544	7677	99	198	297	396	25	15
20	537	8174	99	199	298	397	33	20
25	531	8672	100	199	299	398	42	25
30	9.814525	9.919172	100	200	300	400	50	30
35	519	.919673	100	200	301	401	58	35
40	512	.920175	101	201	302	402	67	40
45	506	0679	101	202	302	403	75	45
50	500	1185	101	202	303	404	83	50
55	494	1692	101	203	304	406	92	55
			102	203	305	407		
39 0	9.814487	9.922201						
5	481	2711	102	204	306	408	9	5
10	475	3223	102	205	307	409	17	10
15	468	3736	103	205	308	411	26	15
20	462	4251	103	206	309	412	35	20
25	456	4767	103	207	310	413	43	25
30	9.814449	9.925285	104	207	311	414	52	30
35	443	5804	104	208	312	416	61	35
40	437	6325	104	208	313	417	69	40
45	430	6848	104	209	314	418	78	45
50	424	7372	104	210	314	419	87	50
55	418	7897	105	210	315	420	95	55
			105	211	316	422		
40 0	9.814411	9.928424						40 0
5	405	8953	106	211	317	423	9	5
10	399	.929483	106	212	318	424	18	10
15	392	.930015	106	213	319	426	27	15
20	386	0548	107	213	320	427	36	20
25	380	1083	107	214	321	428	45	25
30	9.814373	9.931620	107	215	322	429	54	30
35	367	2158	108	215	323	431	63	35
40	361	2698	108	216	324	432	72	40
45	354	3239	108	217	325	433	81	45
50	348	3782	109	217	326	434	90	50
55	342	4327	109	218	327	436	99	55
			109	218	328	437		
41 0	9.814335	9.934873						41 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	log M	log P	Diff. log P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
41 0	9.814335	9.934873						41 0
5	329	5421	110	219	329	438		5
10	322	5970	110	220	330	440	9	10
15	316	6521	110	220	331	441	18	15
20	310	7074	110	221	332	442	28	20
25	303	7628	111	222	333	443	37	25
30	9.814297	9.938184	111	222	334	445	46	30
35	291	8741	111	223	334	446	56	35
40	284	9300	112	224	336	447	65	40
45	278	.939861	112	224	337	449	74	45
50	271	.940424	112	225	338	450	83	50
55	265	0988	113	226	338	451	92	55
42 0	9.814259	9.941554	113	226	339	453	102	42 0
5	252	2121	114	227	340	454		5
10	246	2690	114	228	341	455	10	10
15	239	3261	114	228	342	457	19	15
20	233	3834	114	229	344	458	29	20
25	227	4408	115	230	344	459	38	25
30	9.814220	9.944984	115	230	345	461	48	30
35	214	5561	116	231	346	462	58	35
40	207	6140	116	232	348	463	67	40
45	201	6721	116	232	349	465	77	45
50	194	7304	116	233	350	466	87	50
55	188	7888	117	234	351	468	96	55
43 0	9.814182	9.948474	117	234	352	469	106	43 0
5	175	9062	118	235	353	470		5
10	169	.949651	118	236	354	472	10	10
15	162	.950242	118	236	355	473	20	15
20	156	0835	119	237	356	474	30	20
25	150	1430	119	238	357	476	40	25
30	9.814143	9.952026	119	239	358	477	50	30
35	137	2625	120	239	359	479	60	35
40	130	3225	120	240	360	480	70	40
45	124	3826	120	241	361	481	80	45
50	118	4430	121	241	362	483	90	50
55	111	5035	121	242	363	484	100	55
44 0	9.814105	9.955642	121	243	364	486	110	44 0
5	098	6250	122	243	365	487		5
10	092	6861	122	244	366	488	10	10
15	085	7473	122	245	367	490	21	15
20	079	8087	123	246	368	491	31	20
25	072	8703	123	246	369	493	41	25
30	9.814066	9.959321	124	247	371	494	52	30
35	060	.959940	124	248	372	496	62	35
40	053	.960562	124	249	373	497	72	40
45	047	1185	125	249	374	499	83	45
50	040	1810	125	250	375	500	93	50
55	034	2437	125	251	376	501	103	55
			126	251	377	503	114	
45 0	9.814027	9.963065						45 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	log M	log P	Diff. log P				$\frac{d\phi}{5''}$	Lat.
			1′	2′	3′	4′		
° ′								° ′
45 0	9.814027	9.963065						45 0
5	021	3696	126	252	378	504	11	5
10	014	4328	126	253	379	506	21	10
15	008	4962	127	254	380	507	32	15
20	.814002	5598	127	254	382	509	43	20
25	.813995	6236	128	255	383	510	53	25
30	9.813989	9.966876	128	256	384	512	64	30
35	982	7517	128	256	385	513	75	35
40	976	8160	129	257	386	515	85	40
45	970	8806	129	258	387	516	96	45
50	963	.969453	129	259	388	518	107	50
55	957	.970102	130	260	389	519	117	55
46 0	9.813950	9.970753	130	260	391	521		46 0
5	944	1406	131	261	392	522	11	5
10	937	2061	131	262	393	524	22	10
15	931	2718	131	263	394	525	33	15
20	924	3376	132	263	395	527	44	20
25	918	4037	132	264	396	528	55	25
30	9.813912	9.974699	132	265	398	530	66	30
35	905	5364	133	266	399	532	77	35
40	899	6030	133	267	400	533	88	40
45	892	6698	134	267	401	535	99	45
50	886	7369	134	268	402	536	110	50
55	880	8041	134	269	403	538	121	55
47 0	9.813873	9.978715	135	270	405	539		47 0
5	867	.979392	135	270	406	541	11	5
10	860	.980070	136	271	407	543	23	10
15	854	0750	136	272	408	544	34	15
20	847	1432	136	273	409	546	46	20
25	841	2116	137	274	411	547	57	25
30	9.813835	9.982802	137	274	412	549	69	30
35	828	3491	138	275	413	551	80	35
40	822	4181	138	276	414	552	92	40
45	815	4873	138	277	415	554	103	45
50	809	5568	139	278	417	556	115	50
55	802	6264	139	279	418	557	126	55
48 0	9.813796	9.986962	140	279	419	559		48 0
5	790	7663	140	280	420	560	12	5
10	783	8365	140	281	422	562	24	10
15	777	9070	141	282	423	564	36	15
20	770	.989776	141	283	424	565	48	20
25	764	.990485	142	283	425	567	59	25
30	9.813758	9.991196	142	284	426	569	71	30
35	751	1908	143	285	428	570	83	35
40	745	2624	143	286	429	572	95	40
45	739	3340	143	287	430	574	107	45
50	732	4060	144	288	432	575	119	50
55	726	4781	144	289	433	577	131	55
			145	289	434	579		
49 0	9.813720	9.995505						49 0

TABLE 32.—LOGARITHMIC FACTORS FOR CONVERSION OF LATITUDES AND DEPARTURES IN CHAINS TO DIFFERENCES OF LATITUDE AND LONGITUDE IN SECONDS—Continued

Lat.	log M	log P	Diff. log P				$d\phi$ 5″	Lat.
			1′	2′	3′	4′		
° ′								° ′
49 0	9.813720	9.995505	145	290	435	580		49 0
5	713	6230	146	291	437	582	12	5
10	707	6958	146	292	438	584	25	10
15	700	7688	146	293	439	586	37	15
20	694	8420	147	294	441	587	49	20
25	688	9154	147	295	442	589	61	25
30	9.813681	9.999890	148	295	443	591	74	30
35	675	10.000629	148	296	444	593	86	35
40	668	1370	149	297	446	594	98	40
45	662	2112	149	298	447	596	111	45
50	656	2858	149	299	448	598	123	50
55	650	3605	150	300	450	600	135	55
50 0	9.813643	10.004354						50 0

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